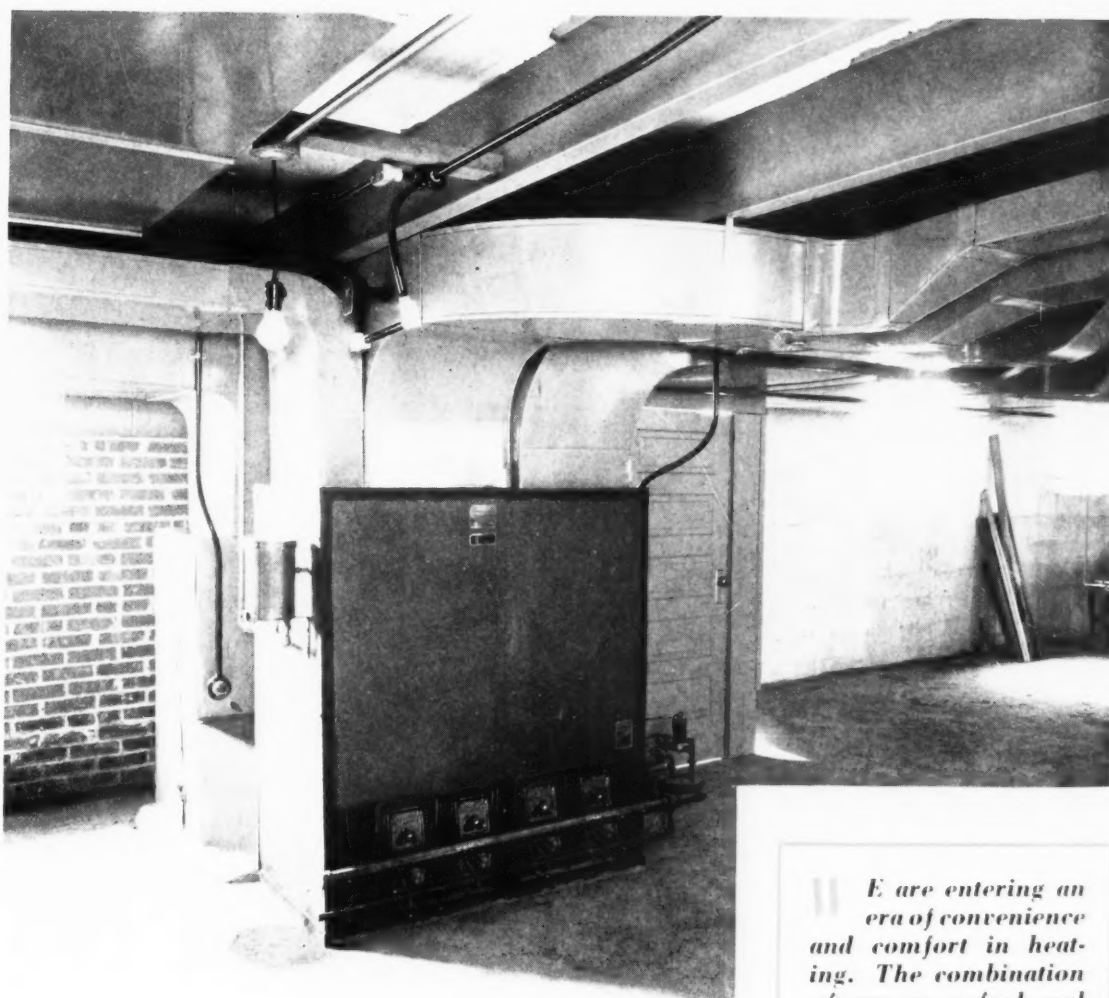


American Artisan

THE WARM AIR HEATING
AND SHEET METAL JOURNAL
FOUNDED 1880



This excellent gas-fired warm air furnace is one of several engineered and installed by one heating engineer in Pittsburgh. Full details of the job are given in this issue.

We are entering an era of convenience and comfort in heating. The combination of gas as a fuel and warm air as the heating medium meets this demand admirably. Co-operative effort between the manufacturer and the heating man will mean profits for both and lasting satisfaction for home owners.

OCTOBER 11, 1930

IT
MUST
BE
GOOD!



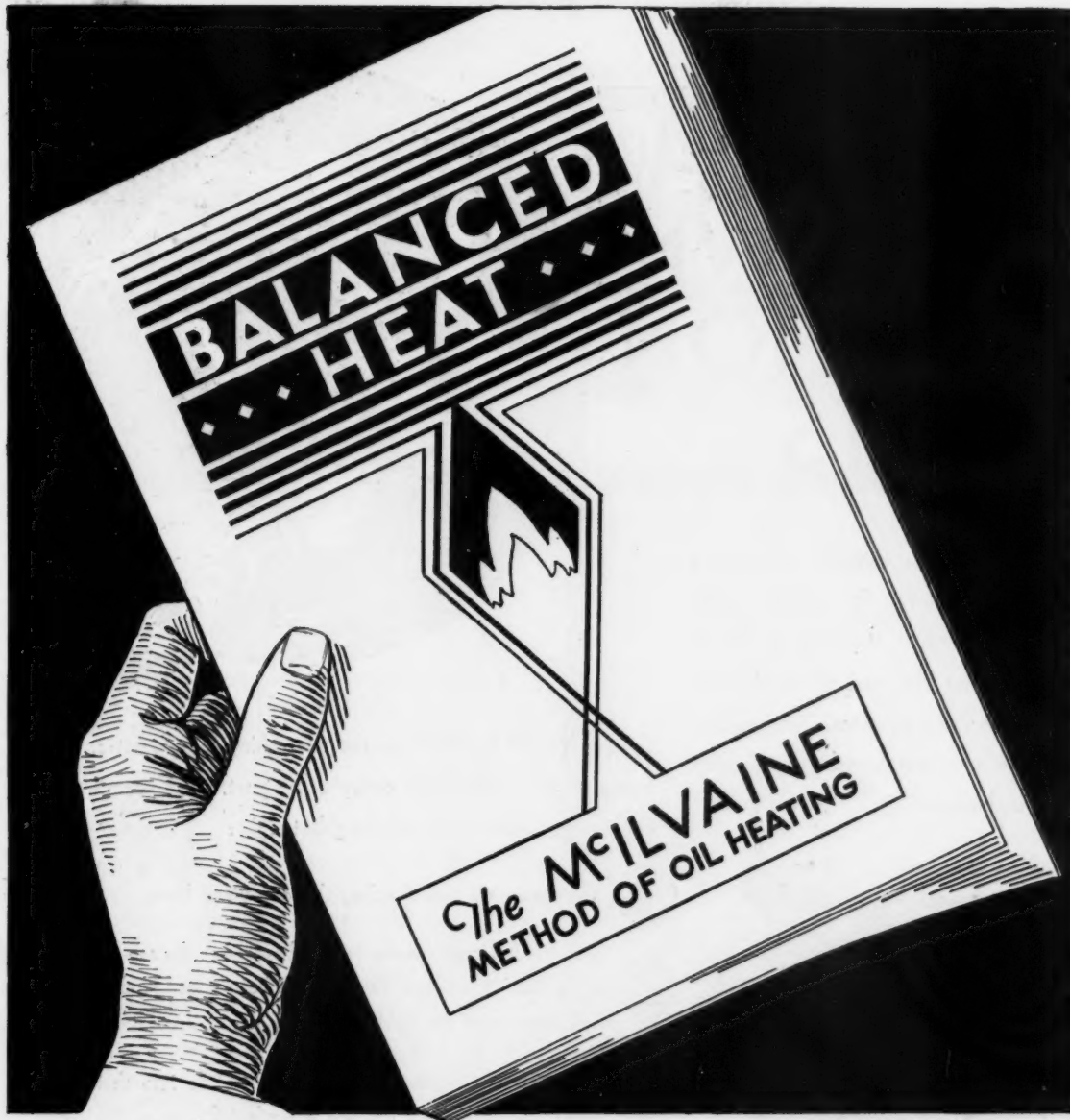
AGRICOLA'S unusual record of satisfactory heating service in tens of thousands of installations throughout the nation, has justly inspired widespread Dealer confidence

in this high quality heating system. If you have not yet investigated the profit possibilities of the Agricola Agency, now is the time to get the facts. Write or wire today.

AGRICOLA FURNACE COMPANY, Inc., Gadsden, Alabama

Offices in Principal Cities

Agricola
FURNACES



WARM AIR HEATING MEN!

Mail Coupon for This Free Book

Get the Real Facts About Oil Heating—clip the coupon and mail it now! We will send you a copy of this sensational new book, which tells about the only Oil Heating System designed for Warm Air Heating. It contains 32 pages of facts that every warm air heating dealer and salesman should know.

Warm air furnaces are designed to operate with a continuous coal fire—they will not stand alternate heating and cooling of intermittent firing. The McIlvaine has a graduated flame that burns continuously and

moderately. It is not turned on and off. No odors—no gas pilot—no electric ignition.

The McIlvaine Oil Burner—fully protected by patents—operates on an entirely different principle from others, and is the only Oil Burner that exactly balances the heat loss caused by outside temperature conditions. It's the Ideal Method of Warm Air Heating, and automatically maintains an indoor temperature that is always just right—comfortable and healthful.

McILVAINE BURNER CORPORATION
747 Custer Avenue, Dept. A, Evanston, Illinois



McILVAINE BURNER CORP., 747 Custer Ave., Dept. A, Evanston, Ill.
Send me, without obligation, your book "Balanced Heat", Sales Plan and proposition to dealers.

Name.....
Street.....
City.....
State.....

Published Every Other Week by Porter, Spofford, Langtry Corp., 139 North Clark Street, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, January 29, 1930, at the Post Office at Chicago, Illinois, under the act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

INDEX PAGES—22 and 64

[VOL. 99, NO. 21—\$2.00 PER YEAR]

BUYERS' DIRECTORY—60 and 62

NIAGARA "BRINGS DOWN" INSTALLATION COSTS

NIAGARA tackles the question of furnace assembly and drops it before it even reaches the line of profit vs. loss. If you haven't seen NIAGARA pull down the cost of installation, you have a treat in store as entertaining as any football game you ever witnessed and directly profitable to your business.



The NIAGARA Warm Air Furnace is a full-value-in-every-part product. One-piece base, one-piece radiator, full cup joint construction throughout, large ash pit and humidifier, and rich oxidized copper front flaked with gold are typical selling advantages.



Setting the NIAGARA is the next thing to automatic. Every part "clicks" into every other part. It's practically impossible to be anything but right:

- ① You waste no time leveling the one-piece base.
- ② Into the full cup groove in the base goes the ash pit, a lug lines it up, and four outside bolts speedily draw the lower front up tight.
- ③ Next, the two sections of the fire pot slide into their tracks, full cup joints insuring a perfect fit.
- ④ The feed section, which goes through the front, settles into position just as quickly—you can't miss. Two bolts at the corners tighten the upper front in a jiffy.
- ⑤ The one-piece radiator, also independent of the front, lines up quickly and naturally

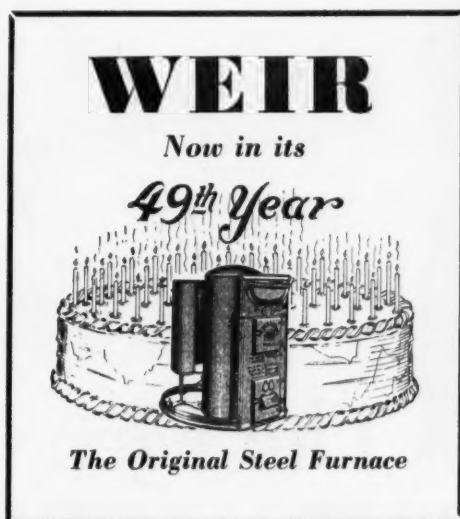
Every one of these operations is a time-saver, a money-maker. And, best of all, far from being "corner-cutters", they are valuable features which heighten the value-giving quality of the NIAGARA Warm Air Furnace, and guarantee to your customers the kind of service that makes them enthusiastic rooters for you and the furnace you handle. Write us today for the full NIAGARA line-up.

THE FOREST CITY-WALWORTH RUN FOUNDRIES CO.
2500 WEST 27th STREET, CLEVELAND, OHIO

NIAGARA

WARM AIR HEATING SYSTEMS

Say you saw it in *AMERICAN ARTISAN*—Thank you!



THE past month marked the birthday of the Weir. The first patent date appearing on the front puts the Weir in its 49th successful year.

Countless improvements and refinements have been incorporated in the Weir during these many years but still it is basically the same.

Foremost of the original characteristics retained and one which it most tenaciously clings to is its out-of-the-ordinary high quality.

The continuous steady growth of the Weir is attributed to this fact more than to any other of its many outstanding features. The great tendency toward steel construction in warm air furnaces is a direct compliment to the Weir—the original steel furnace.

The Meyer Furnace Company
Peoria, Illinois



H. S. SHARP
Vice President of The Henry
Furnace & Foundry Co.

The Men behind **MONCRIEF FURNACES**

IN the camouflage division of the army, H. S. Sharp probably wouldn't amount to much. Throwing up smoke screens isn't his specialty at all. Not that he voices all he thinks, but he always means what he says, and nine times out of ten, he is on the right side of an argument.

It is quite natural that men believe in him; and they like him immensely because he is so modest about it all.

All his business life, H. S. Sharp has been in the warm air heating business. At the outset, it looked as though he would be dealing in asbestos, and that sort of thing. But he wanted something hard; and he got in when he switched, after a couple of years, to furnaces.

We believe it was Euclid who discovered that a straight line is the shortest distance between two points. If that axiom had not been put in our text books, Harold Sharp would have announced it to the world at this time.

Thirty seconds after you begin a conversation with him, you are distinctly conscious that he is thinking straight through and getting to the heart of the subject at once. "The longest way round is the shortest way home" finds no response in his way of thinking.

As an organizer he is outstandingly successful. In all this country there are probably no other dealers' meetings like those of the Authorized Moncrief Furnace Dealers Association, for there is only one H. S. Sharp. There is never a dull moment in these meetings,—something popping every minute; and if any dealer present goes home without better understanding of selling and of furnace installing—well, it is his own fault.

About twelve years ago, Harold Sharp came with this company as assistant sales and advertising manager. His advance has not been spectacular but steady. This year he was elected vice president, in charge of sales and advertising.

No man in the industry is more earnest in working to put it on a better basis than is H. S. Sharp. He believes in the Standard Code from first to last; and morning, noon and night is preaching the gospel of proper installing as the way out of the wilderness. His efforts have resulted in the company's requiring that all Moncrief Furnaces in Cleveland be installed according to the Code.

1 1 1



The customer who is always wanting what one hasn't got is surely stopped by the dealer who handles Moncrief Furnaces.

Cast furnaces, steel furnaces, of every type and size comprise the Moncrief line, everything high grade, well made, at a price the prudent house owner or builder does not hesitate to pay.

Included in the Moncrief prospective is a fine assortment of sales and advertising helps. Write for details.

THE HENRY FURNACE & FOUNDRY CO.
3471 EAST 49th STREET CLEVELAND, OHIO

We supply everything used in a warm air heating job

Say you saw it in AMERICAN ARTISAN—Thank you!

You Can't Duplicate This Complete Line of "AFCO" Furnaces. Every Type of Furnace the Dealer Needs Can Be Bought From One Manufacturer. And Every Type of Furnace the Leader In Its Class

"AFCO" Supremacy Again Demonstrated!



Thermo Cast Furnaces

Made in Five Sizes

Thermo Open Dome Furnaces

Made in Five Sizes

Thermo Pipeless Furnaces

Made in Five Sizes

"AFCO" R. E. Style Boiler Plate Furnaces

Made in Six Sizes

"AFCO" T Style Boiler Plate Furnaces

Made in Six Sizes

"AFCO" Crescent Style Boiler Plate Furnaces

Made in Six Sizes

"AFCO" Delux Healthful Heating Units

Made in Four Sizes

"AFCO" Duo-Blo Industrial Unit Heaters

Made in Four Sizes

*Write for information on any or all of these
popular furnaces—today*

AMERICAN FURNACE COMPANY

2719-31 Morgan Street

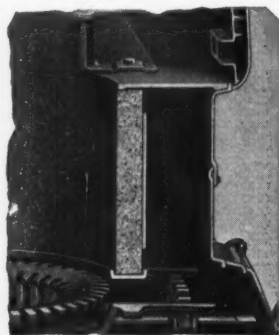
St. Louis, Missouri

Mention AMERICAN ARTISAN in your reply—Thank you!

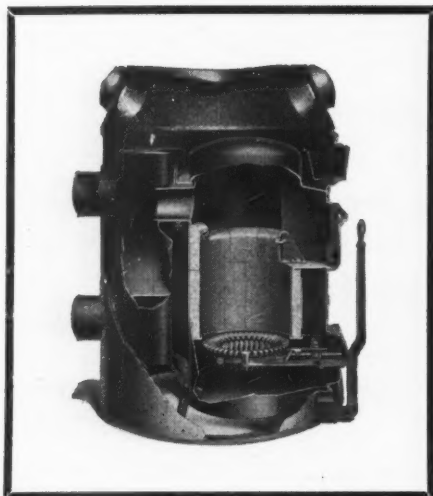
The New Sunbeam Steel Furnace

BETTER FOR BURNING COAL

BETTER FOR BURNING OIL



Full Height Fire Pot



Sunbeam Superiorities Include the Following:

1. Duplex Grates
2. Reinforced Smoke Collar
3. Direct Draft Damper Outside of Casing
4. One Piece Overlapping Head
5. No Direct Connection between Drum and Casing

SUNBEAM

WARM-AIR FURNACES

THE FOX FURNACE CO.
Elyria, Ohio

Please send prices and complete information on
Sunbeam Steel Furnaces to

Name.....

Address.....

City and State.....

A-11

The Sunbeam fire pot measures 14½ inches from grate to top—is almost twice as high as the fire pots in many steel furnaces. Consequently, it is only logical to expect from this modern type of heating plant, more uniform heat, more economical fuel consumption and a decidedly longer firing period.

Through this innovation, Sunbeam designers have eliminated one of the most serious disadvantages of the steel furnace.

However, this is only one of the numerous superiorities that you find in this new product. There is not a joint—seam—opening—through which smoke, gas, dust, ashes, fumes or oil can penetrate into the warm air chamber. The Sunbeam is welded into a seamless unit with the latest electric arc-welding equipment. And the welds are stronger than the boiler plate.

You should see the one-piece Sunbeam head, ¼ inch thick, which **overlaps** the one piece drum, eliminating joints at the top of drum and pouch. You should compare this construction with older types of steel furnaces. You should examine the ingenious design which eliminates the joint between drum and casing.

And Sunbeam quality talks price. Quantity production enables you to buy these furnaces at surprisingly moderate prices—in some cases, at less than the cost of inferior heating plants.

Install one of the new Sunbeam Steel Furnaces on your next job. See, first hand, the kind of service that you can expect of it. Compare it with the heating plants with which you are familiar. Immediate shipment will be made. Ask for prices and complete information, today. The coupon below is for your convenience.

*A Furnace for Every Requirement
Quantity and Price, Both*

The Fox Furnace Company, Elyria, Ohio

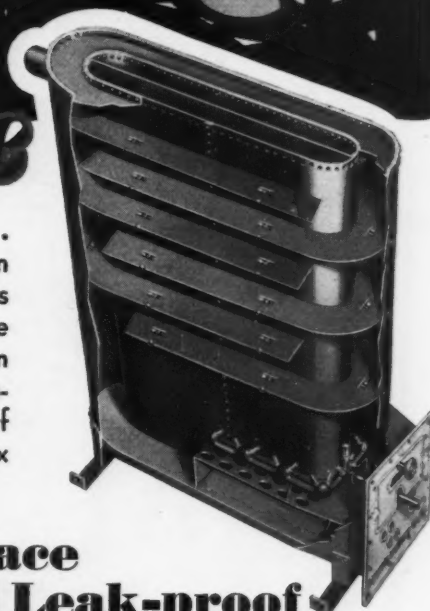
*A Division of American Radiator
and Standard Sanitary Corporation*

Say you saw it in AMERICAN ARTISAN—Thank you!



Gas-Fired Furnace

ECONOMICAL ... SAFE ... DURABLE ...
 eliminates coal shovels, ash piles and advance investments in fuel ... adds another usable room to the house and orders its own fuel through one small pipe line. Such conveniences are combined with the ultimate in economy, safety and durability in the new Torrid Zone gas-fired furnace. It has more primary heating surface per B.T.U. input than any other standard make of gas furnace. This coupled with the long smoke travel around six horizontal baffles produces its very high efficiency.



Heaviest Steel Used in Gas Furnace Construction Riveted and Calked Leak-proof

The Torrid Zone is constructed of copper-bearing, rust resisting, boiler plate steel three times as thick as that used in other steel or sheet metal gas-fired furnaces.

Like a high pressure boiler ... every seam is riveted for strength and calked for permanent tightness. The warm air will always be clean and free from gas odors. Compare Torrid Zone prices with all others. You will find them far below any other gas-fired furnace that even approaches the durability and economy and safety of the Torrid Zone.

Write today for complete information and description of the many outstanding features which identify the Torrid Zone as the world's finest automatic gas-burning furnace.

LENNOX FURNACE COMPANY, INC.

Marshalltown, Iowa

Syracuse, New York



Mention AMERICAN ARTISAN in your reply—Thank you!

A Heat Regulator for the small home

—at prices to fit every pocketbook



Return to a warm home after spending an evening out



This heat regulator tends the fire while you are away

This heat regulator ends fire-tending worries



"Can you really buy a heat regulator for as little as that?"

NOW every home can enjoy the luxury of automatic heat control. Warm rooms at rising time. Even, healthful temperature all day. Less fire-tending. Better health and reduced doctor bills.

For whether you live in a bungalow or a mansion, in city, suburb or country, there is a Jewell Temperature Regulator to fill your needs and priced easily within your means. The Jewell is just the kind of heat regulator you have always wanted. Accurate, reliable, economical. Made by Minneapolis-Honeywell, America's leading manufacturer of automatic heat controls for 45 years. Just wind the clock on the Jewell and it automatically slows down the fire as night and raises it again before you get up. The saving in fuel is surprising.

Ask your heating dealer about how the Jewell can be installed on your heating plant at low cost. Talk to him about it now, before winter begins. If you do not know his name, write to us.

Minneapolis-Honeywell Regulator Co.,
 1221 Park Ave., Minneapolis, Minn.
 or
 1221 Park Ave., New York 28, N.Y.

Just think of the luxury of returning to a warm, cozy home every time you spend an evening out, with no one left at home to tend the fire but the Jewell Temperature Regulator. And never a worry about the fire getting too high while you are away. For the Jewell keeps your house by always keeping the fire under control, just as you other luxuries, too, are evenly heated all day. Reduces doctor bills. It keeps you warm when you get up, and cools it down when you get up, surprising.

Minneapolis-Honeywell Regulator Co.,
 1221 Park Ave., Minneapolis, Minn.
 or
 1221 Park Ave., New York 28, N.Y.

The Jewell line of high-grade heat regulators offers a range of models to suit every home and every budget. There is the Jewell Junior, the lowest priced model. And others up to a deluxe model, clock-equipped to automatically slow down the fire at night and raise it to keep your home at any desired comfortable temperature all day. And the saving in fuel is surprising.

You know the Jewell is dependable. It's made by Minneapolis-Honeywell, America's leading makers of heat controls for 45 years. Your heating dealer will give you the best advice on what Jewell heat regulator to install on your present heating plant at reasonable cost. If you do not know his name, write direct to us.

Minneapolis-Honeywell Regulator Co.,
 1221 Park Ave., Minneapolis, Minn.
 or
 1221 Park Ave., New York 28, N.Y.

NOW

Jewell

TEMPERATURE REGULATOR

THERE'S A JEWELL FOR EVERY HEATING PLANT AND FOR EVERY BUDGET

ADVERTISED

ADVERTISED *to the* BUYING PUBLIC


The Jewell line is a proved success without advertising. Sales have climbed steadily. Engineering leadership is established. The market is huge. Consumers who have heard of Jewell Regulators from their dealers have faith in the quality and efficiency of the Jewell line.

Now the tremendous selling power of national advertising goes to work to help you sell more Jewell Temperature Regulators.

1,550,000 readers of *Better Homes and Gardens* and *Popular*



Science are learning about the comfort and convenience of automatic heat with Jewell controls.

 This great campaign is destined for success—if you back it to the limit. *Extra* display, extra selling effort behind the Jewell line *now* mean more sales for you.

MINNEAPOLIS-HONEYWELL REGULATOR CO.
2726 Fourth Avenue So., Minneapolis, Minnesota

Jewell

Say you saw it in *AMERICAN ARTISAN*—Thank you!

SILENTAIR

ORIGINATORS

Centrifugal Blower Type
FURNACE FAN (blower)
and
AIR WASHERS

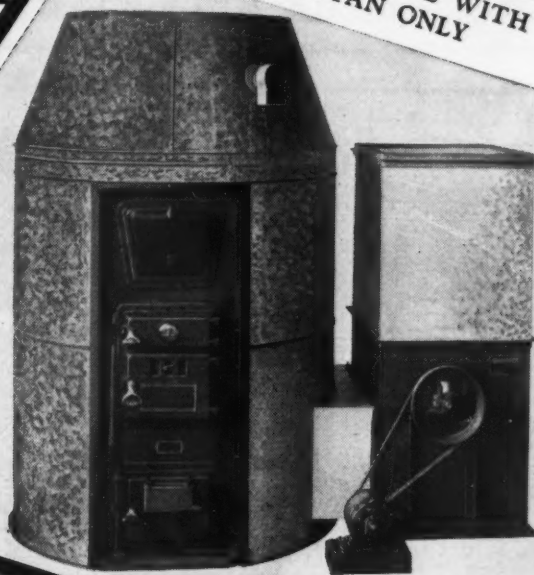


WARM AIR FURNACE WITH
SILENTAIR FAN & AIR WASHER

Stock of
SILENTAIR FANS
and AIR WASHERS
carried by

Lennox Furnace Co.
Marshalltown, Iowa
Heating & Ventilating
Engineering Co.

447 Monadnock Block
Chicago, Ill.



WARM AIR FURNACE WITH
SILENTAIR FAN ONLY

DISTRIBUTORS AND MANUFACTURERS

Anderson & Krapp, Toledo, Ohio—Dist.; Andes Range & Furnace Corp., Geneva, N. Y.—Mfg.; The Beckwith Co., Dowagiac, Mich.—F. Mfg.; Bryant Heater Mfg. Co., Chicago, Ill.—Mfg.; Fox Furnace Co., San Francisco, Calif.—F. Mfg.; Fox Furnace Co., Elyria, Ohio—Mfg.; General Heating & Ventilating Co., Christchurch, N. Z.—Dist.; Heating & Ventilating Engineering Co., 447 Monadnock Block, Chicago, Ill.—Dist.; Heating Supply Co., Pittsburgh, Pa.—Dist.; International Heater Co., Utica, N. Y.—Mfg.; Kelsey Heating Co., Syracuse, N. Y.—F. Mfg.; Lennox Furnace Co., Marshalltown, Ia.—F. Mfg.; Lennox Furnace Co., Toronto, Ont., Canada—F. Mfg.; Lennox Furnace Co., Syracuse, N. Y.—Mfg.; P. H. Magill Foundry & Furnace Co., Bloomington, Ill.—F. Mfg.; L. J. Mueller Furnace Co., Milwaukee, Wis.—F. Mfg.; Munkel-Rippel Heating Co., Columbus, Ohio—Dist.; D. E. McCulley Co., Omaha, Nebr.—Dist.; McPherson Furnace Supply Co., Portland, Ore.—Dist.; Montag Stove Works, Portland, Ore.—Mfg.; Monk & Evers, Spokane, Wash.—Dist.; Majestic Furnace Co., Seattle, Wash.—Mfg.; Robinson Furnace Co., Chicago, Ill.—Mfg.; James Spear Stove & Heating Co., Philadelphia, Pa.; The Thatcher Co., Newark, New Jersey—Mfg.; Thermostat Devices Co., Wollaston, Mass.—Dist.; Tay-Holbrook Co., San Francisco, Calif.—Dist.; Waterman-Waterbury Co., Minneapolis, Minn.—F. Mfg.; Wayne Home Equipment Co., Fort Wayne, Ind.—Mfg.; Western Furnaces, Inc., Tacoma, Wash.; Zimmerman's Bldg. Specialty Co., New Orleans, La.—Dist.

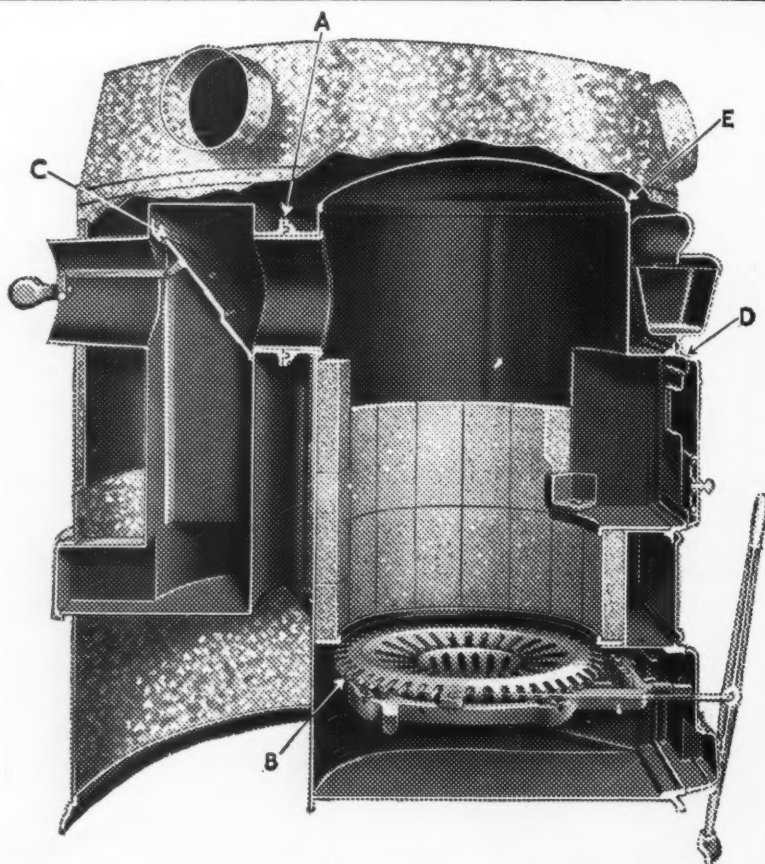
SILENTAIR FURNACE FANS & AIR WASHERS

Manufactured By

A. GEHRI & CO., Tacoma, Washington

(Established 1892)

Mention AMERICAN ARTISAN in your reply—Thank you!



ROUND OAK "MOISTAIR" BOILER-PLATE

*A better steel furnace with
Round Oak quality
throughout—*

- A.** Double cemented tongue and groove joint bolted permanently gas-tight with extra cast collar liner.
- B.** Special easy duplex grate burns any fuel clean and efficiently. Shakes with two fingers by waist-high lever.
- C.** Special direct draft damper operates automatically when feed door opens. No rods to pull—nothing to stick.
- D.** Machine-milled feed and ash-pit doors fitted draft-tight to extensions coming through front, assure positive fire control.
- E.** Seamless electric arc-welded unit construction, only one joint inside casing and that bolted and cemented permanently gas-tight.

Your orders for steel and cast furnaces can be filled promptly. Wire—write or phone US.

Made by THE BECKWITH COMPANY, DOWAGIAC, MICHIGAN



NEW
1000
SERIES

Meet Competition With This

New Furnace

*The improved design and added features
make it the outstanding leader in its field*

CHALLENGE

HERE'S the furnace with some real up-to-date features—plus real quality.

Square-Back Ashpit—Triple-Seal joints—Lever Shaker handle—straight side two piece fire pot and smoke collar extending through casing.

Greater Grate Area—Greater Heating Surface and Increased Standard Code Rating.

Challenge competition and win sales with the Challenge. Write today for complete information and prices.

STANDARD FOUNDRY & FURNACE COMPANY, DeKalb, Illinois

Also Manufacturers of Hero Air Washer and Titan Superheater Furnace

Say you saw it in AMERICAN ARTISAN—Thank you!

You can sell every prospect a high quality steel furnace!

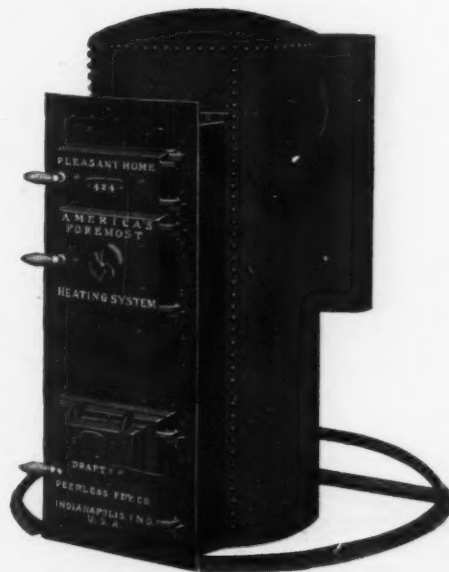
EVERY prospect can't be sold a *Peerless* Steel Furnace but when you can't sell them a *Peerless* Steel Furnace you can still offer them a *high quality* steel furnace at a *much lower price*. Peerless dealers agree with us that the

PLEASANT HOME

is a *good high quality* steel furnace. Of course it is not as good as a *Peerless* but it is worthy of the Peerless name, otherwise we would not recommend it.

It is not the lowest price steel furnace on the market—good quality always costs more but its price is very attractive. Let us send you full details and prices today.

Made by the Builders of the Peerless Cast Furnace



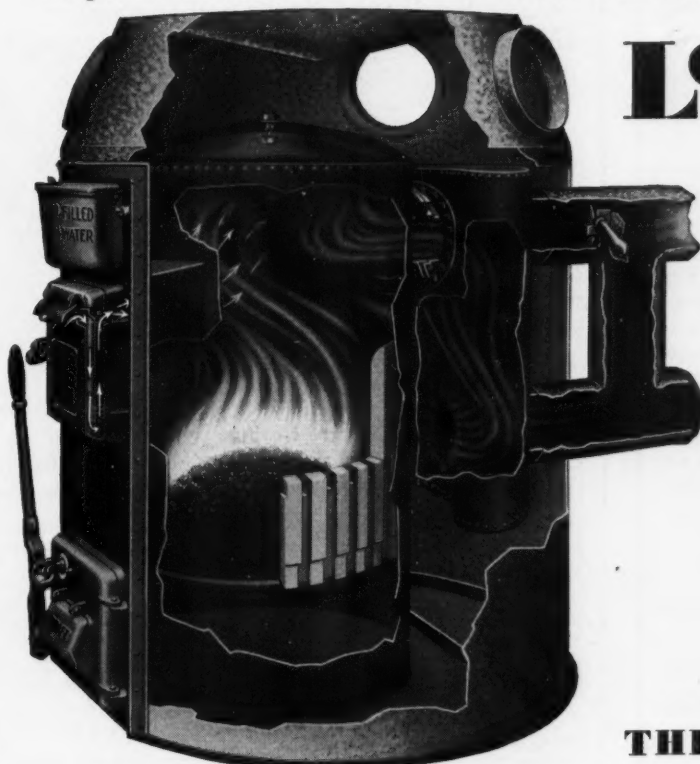
THE PEERLESS FOUNDRY COMPANY INDIANAPOLIS, IND.

Bailey-Farrel Mfg. Co., Warehouse
Distributors at Pittsburgh, Pa.

Warehouse
YOUNGSTOWN, OHIO

"OLD WINE IN NEW BOTTLES"

Replace Those Obsolete and Worn Out Heating Plants with the Improved



LONDON BOILER PLATE FURNACES

*They Are Cold Riveted and Welded
Smoke, Gas and Fume Tight*

*They Have Balanced Heat Surfaces
Which Mean Efficiency and Economy*

*Are Equipped with Either Duplex Bas-
ket Dump, Triangular or Draw-Center*

GRATES AND RADIATORS

FOR
SOFT OR HARD COAL, COKE OR OIL

THE LONDON FURNACE CO. LONDON, OHIO

THOS. W. PEARSON—Sales Manager

*They Cost No More Than the Troublesome Kind.
Prompt Shipment Guaranteed.*

Mention AMERICAN ARTISAN in your reply—Thank you!

Everlasting Good Will and Profits

with the

Vernois



A BETTER BUILT FURNACE

The Radiator is made in one piece with large air space for free uninterrupted air travel.

The Combustion Chamber is built extra heavy to withstand hard usage.

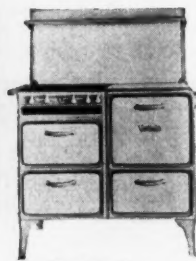
The Two Piece Fire Pot allows for expansion and contraction and is made with unusually large cup joints.

The VERNOIS is building good will and getting new customers everywhere.

Ask for our catalogue and dealer proposition today. No obligation.



Vernois Cabinet Circulator



Vernois Gas Range

VERNOIS Circulators and Gas Ranges are of the same high quality as the Furnace

MT. VERNON FURNACE & MANUFACTURING COMPANY, Mt. Vernon, Ill.

BRILLION FURNACES

High Quality—Low Price—Quick Delivery



NOW when business is starting to pick up fast is a good time to make this sales spurt net you bigger profits.

Your customers will approve Brillion design, quality and features.

They will easily recognize it as a high grade product.

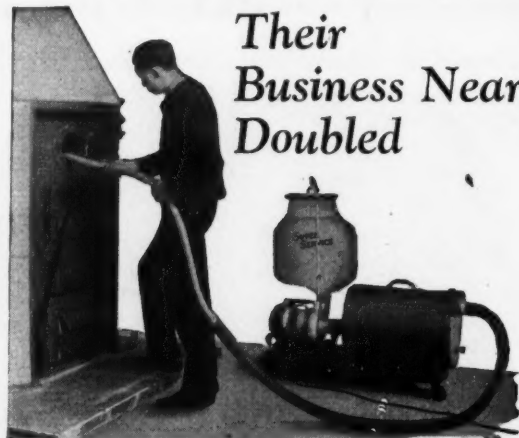
Sell this high quality—it costs you less and gives you a greater profit.

QUICK DELIVERY ON ALL SIZES

Send the coupon today

BRILLION FURNACE CO.
200-300 Park Ave., Brillion, Wis.
Send me full details and Catalog No. 80.

Name.....
Address.....



Our one-man outfit makes low overhead.

Their Business Nearly Doubled

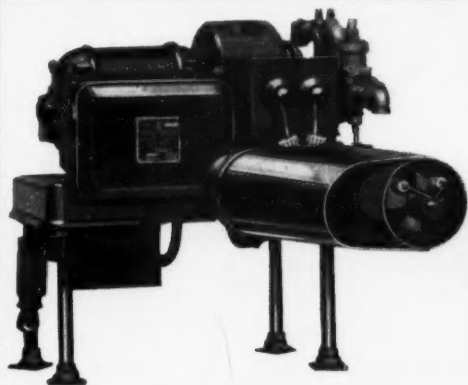
A LETTER from Penna. Sheet Metal & Heating Co., Detroit, shows how Super Suction cleaning boosts a dealer's business. It says:

"We have been very successful with our Super Suction Cleaner. Our men solicit only for cleaning, but almost every cleaning develops into a repair or reset, and we have sold several replacements, very much to our own and the salesmen's joy. Our cleaning and repairs are almost double last year's."

Why not double yours? Prove it first by a free trial. Write today for details.

THE NATIONAL SUPER SERVICE CO.
1944 North 13th Street Toledo, Ohio

Say you saw it in AMERICAN ARTISAN—Thank you!



Now - \$74 Less for This 1931 Model **BETTENDORF** AUTOMATIC OIL BURNER

Listed by the Underwriters Laboratories

*Proved under every heating condition to be a perfect
type burner for warm air plants*

Six models. Capacities 11½ to 13 gals. per hour

**NEW
DEALER'S
PRICE**

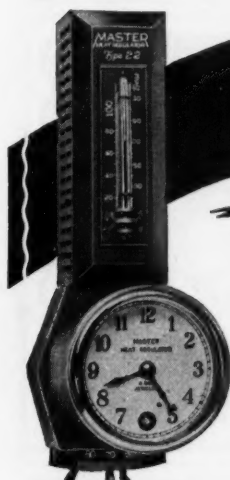
\$159⁷⁵

**FORMER
PRICE
\$234**

NOTE THESE FEATURES: Webster Transformer, Cuno Oil Filter, Minneapolis Honeywell Controls, Detroit Lubricator, Pressure Regulating Valves, Century Motor, Tuthill Pressure Pump, Webster Radio Filter.

WRITE TODAY FOR FULL DETAILS OF OUR 30 DAY TRIAL ORDER

BETTENDORF MFG. CO., BETTENDORF, IOWA



**MASTER
HEAT REGULATOR**

Type 22

FULL ELECTRIC

**Adds Handsome Profits
to Your Furnace Sales**

WITH the MASTER Heat Regulator you can offer complete, full-electric furnace regulation at a low, popular price—and add substantial extra profits to your furnace sales.

Full Electric, 8-Day Jewelled Clock, **\$80**

8-Day Jewelled Clock. Automatically turns heat on and off, morning and night. Also models without clock control.

Closer Regulation. Acts instantly when heat changes 1° or less if desired.

Flawless construction—long life—dependable service. Made by the manufacturers of the MASTER gradual operation Heat Regulator.

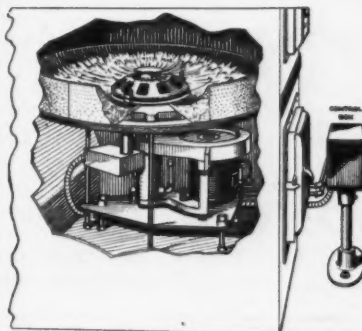
A money maker for dealers. Write today for complete details.

WHITE MFG. CO.
2362 University Avenue
St. Paul, Minn.

Full Electric, without Clock Control, **\$55**



The Berryman Rotary Oil Burner } **\$139.⁵⁰** Complete with All Controls F.O.B. Chicago



THE Berryman Rotary Oil Burner is a marvel of simplicity. There are only two moving parts—the motor armature and the spinner oil distributor.

The burner is easily installed in any type of furnace and is just as easily removed for inspection without disconnecting a single part.

Fully automatic in operation; economical; silent; nothing to get

out of order. Guaranteed for two years, will give a life time of service.

If you will act promptly to secure the Berryman franchise you can enjoy extra profits you are missing now, with little additional effort. Every customer—new or old—is a prospect for a Berryman. Each installation will sell several more, thus multiplying your profits.

*Let us tell you more about our attractive
dealer proposition*

Berryman System of Oil Heating, Inc.

SUCCESSFUL MANUFACTURERS, WHOLESALERS AND RETAIL
DISTRIBUTORS OF OIL BURNING EQUIPMENT SINCE 1918

1300 West Washington Boulevard

CHICAGO

Mention AMERICAN ARTISAN in your reply—Thank you!

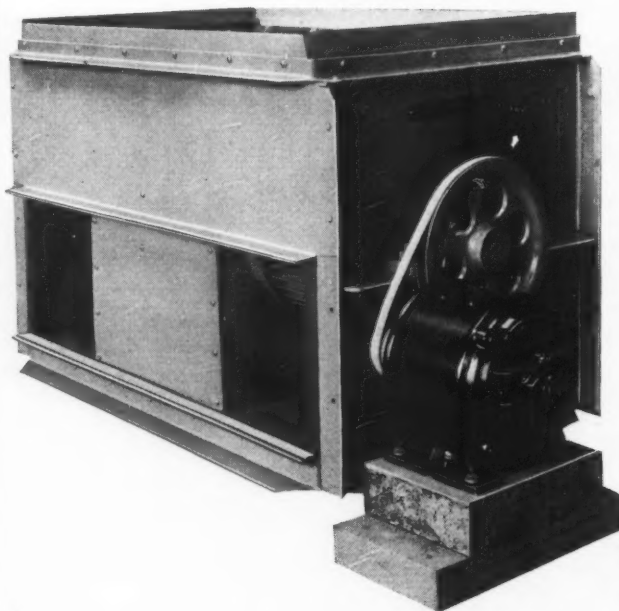
BRUNDAGE FORCED AIR SYSTEM

—NON DAMPER TYPE

THE LATEST BRUNDAGE DEVELOPMENT

for oil or gas fired furnaces or
straight mechanical systems
with any fuel.

COMPLETE
EFFICIENT
QUIET
COMPACT



Indispensable to Progressive Dealers, Jobbers and Furnace Manufacturers. Write or wire for details and attractive prices.

THE BRUNDAGE COMPANY, KALAMAZOO, MICHIGAN

You'll sell more warm air jobs just by showing the A-C Booster—

An A-C demonstration induces "shopping" prospects to decide in your favor—

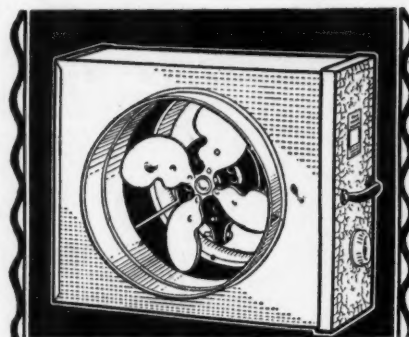
A-C *Thermostatically Controlled*
Automatic
HEAT BOOSTER

A-C MANUFACTURING COMPANY, 417 Sherman St., Pontiac, Ill.

HERE is a fan that is truly powerful, quiet, efficient, trouble free, simple and practically vibrationless. It fits in a cold air by-pass on any job and it is effective in moving the air.

The Mercury Control makes it fully automatic—an unusual feature and one not found on any other fan at any where near the A-C price. The A-C is easy to install—cuts labor costs—made in several sizes for all types of jobs.

Write for full details—order through your jobber



No. 9 size unit with 10-inch Outlets. Mercury Control, Heat Booster, Fan and Unit—Complete to the dealer..... \$36.00

A Heat Hustler Fan Forces Air Through a Single Warm Air Pipe

Heats garages, sun porches and other rooms that will not heat by gravity. Mounts directly in the warm air pipe. Draws heat from the furnace and forces it into the hard-to-heat room. Quick heat for a bathroom.

Four reasons why you should use the American Heat Hustler:

1. It uses a positive pressure, rotary type fan.
2. Motor is outside the warm air flow, adding greatly to life of motor and leaving as much space for gravity air flow as before the Heat Hustler was installed.
3. It is quiet.
4. Furnished for either automatic or manual control.

Price list, with descriptive literature showing different models, sizes, etc., will be sent you by return mail upon receipt of your request. CLIP AND SEND THIS AD IN NOW!

AMERICAN FOUNDRY & FURNACE COMPANY

Bloomington,

World's largest manufacturers
of blower furnace systems

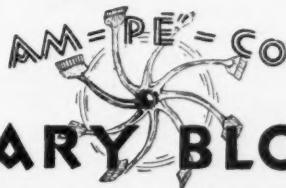
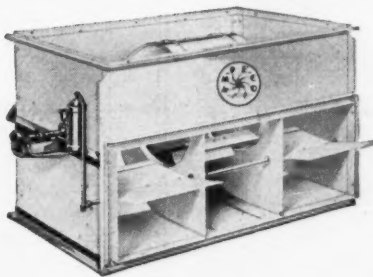
Illinois



Say you saw it in AMERICAN ARTISAN—Thank you!

It speeds up sales and increases profits

EVERYWHERE live contractors are turning their efforts to forced air jobs—that's where the big profits are and where the future of warm air heating lies. The Am-Pe"-Co Blower is speeding up the sales of this type of installation.



ROTARY BLOWER

THE Am-Pe"-Co Rotary Blower is designed with Dampened Outlets. When the blower stops, the dampers open automatically. An Oil Pump and Regulator of our own design insures positive operation. Am-Pe"-Co has another exclusive feature—an air chamber back of blower

housing provides fully balanced air distribution to both inlets and unrestricted entry of free air from top, side and bottom of inlets.

Write today for full details and prices—put the Am-Pe"-Co to work for you now.

AMERICAN MACHINE PRODUCTS COMPANY

Marshalltown, Iowa

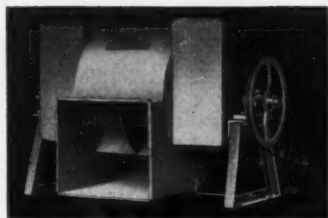
Furblo The Furnace Blower Everyone Recommends

MANUFACTURERS have adopted FURBLO as standard equipment—jobbers catalog FURBLO exclusively—dealers everywhere find FURBLO the one and only satisfactory solution to the problem of mechanical warm air heating.

FURBLO is not a fan—but a blower. Quiet, efficient, powerful, sturdy, dependable. Guaranteed to always produce on even the hardest job.

Lakeside Company
Dept. AAA-S, Hermansville, Mich.

Makers of Lakeside Ventilating Equipment



Two sizes fit practically all installations. Send for complete information.

only **\$48** installed

All Electric—plus 4 Exclusive Features



- 1 Automatically checks furnace in event of electrical current break.
- 2 Automatically re-engages after fueling.
- 3 Gradual operation of draft and damper. No banking up of gas or smoke.
- 4 No weights, electric motor, clock or dry batteries—nothing to oil.

Simple to install. Thousands are in use. Listed as standard by Underwriter's Laboratories.

SHEER COMFORT
heat Regulator

Ask your jobber or wire
H. M. Sheer Co., 213 Hampshire St., Quincy, Illinois

Dealer Price
\$22.75
f.o.b. Quincy, Ill.



KORECTAIRE The CORRECT AIR MACHINE

—it makes any warm air heating job an
AIR CONDITIONING SYSTEM

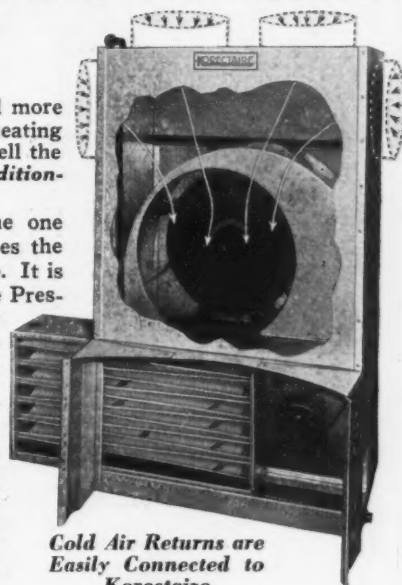
It takes up little space

YOU can land more warm air heating jobs when you sell the idea of Air Conditioning.

Korectaire is the one machine that does the Three-in-one job. It is a Silent, Positive Pressure Blower—it humidifies the air and cleans it.

Write for agency details now—

Right now you need the Korectaire on your sales floor—you need it to close the bigger jobs and to make better profits. Send today for illustrated circulars and prices.



Cold Air Returns are Easily Connected to Korectaire

WATT MANUFACTURING COMPANY
STERLING, ILLINOIS

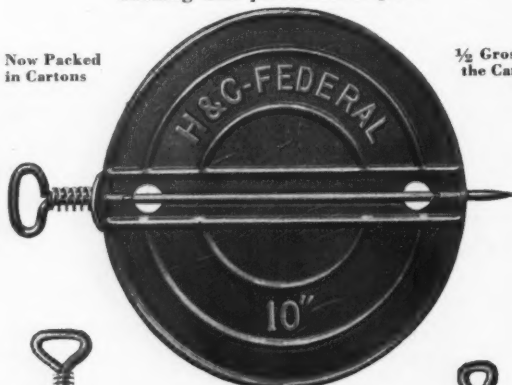
Mention AMERICAN ARTISAN in your reply—Thank you!

for
**ACE-HIGH QUALITY
and ECONOMY, TOO,**

handle H & C furnace accessories—Correctly designed, accurately made of finest materials, attractively priced. Get the benefit of full freight allowance by purchasing all of your accessories, with your registers, from this one reliable source.

Catalog and prices on request

Now Packed
in Cartons



$\frac{3}{4}$ Gross to
the Carton

**An Exceptionally
Fine Damper—**

Formerly sold under the trade name "STAR," this steel warm air damper has been very popular for years. It is exceptionally well made. Handle enters either side of disc. Furnished in 6", 7", 8", 8 $\frac{1}{2}$ ", 9", 10", 12", and 14" sizes.



No. 101 Clip

Samples and prices on request

**Sturdy, Economical
No-Rivet Clips
and Tips**

Made of heavy gauge steel. Prongs provide quick and secure means of fastening to disc without rivets. Also punched with rivet holes.



No. 102 Tip



*All the Leading Styles
and Sizes of Chain*



No. 10



No. 11



No. 00

No. 18

**Pressed Steel
Furnace Pulleys in a
Variety of Styles and Sizes**

HART & COOLEY MFG. COMPANY

Successors to Federal Mfg. Company

CHICAGO, 61 W. Kinzie Street

PHILADELPHIA, 1600 Arch Street

NEW YORK, 101 Park Avenue

BOSTON, 75 Portland Street

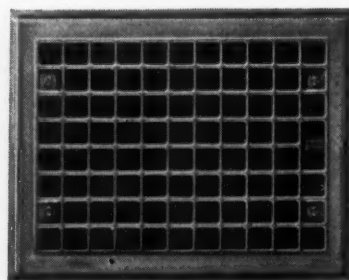
NEW BRITAIN, CONN.—NASHUA, NEW HAMPSHIRE

Factories at Holland, Mich., New Britain, Conn., Nashua, N. H.

AN ALL-STEEL REGISTER

**FEATURING
ADDITIONAL
STRENGTH**

Style
79



Multi-
Valve

Stronger because of steel folded straight back and its unbroken mesh corners—made in same sizes as our famous style 80 "Cobble" Register.

TUTTLE & BAILEY MFG. CO.

Est. 1846

441 Lexington Ave., New York

36 Portland Street, Boston

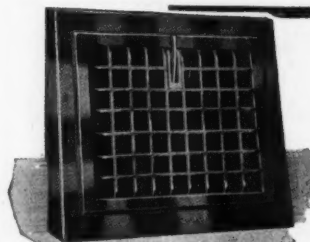
407 S. Dearborn St., Chicago

704 E. 18th Street, Kansas City

2105 S. San Pedro St., Los Angeles

OLDEST—LARGEST—FOREMOST

Manufacturers of Registers in the World



The ARISTOCRAT
(Patented)

Registers of every type, size and finish for Heating and Ventilating.

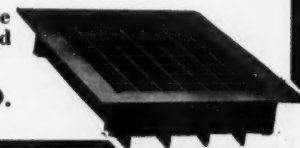
AUER REGISTER CO.

3608 Payne Avenue
CLEVELAND, OHIO

AUER'S

Permanently
Perfect Operating
Registers—

Also Grilles and
Clothes Chute Doors



Our customers tell us that this register doesn't streak the walls and that it is quickly installed.

**ALL THIS AND MORE,
AT NO GREATER
COST**

*"It's different
from all the
rest"*

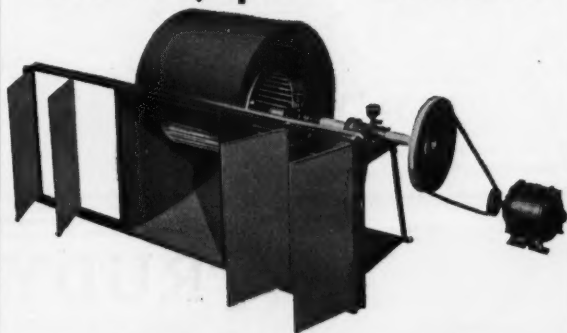
SYMONDS REGISTER COMPANY

3117-23 Minnesota Ave.

St. Louis, Mo.

Say you saw it in AMERICAN ARTISAN—Thank you!

THE MILES BLOWER with By-pass Louvers



**Scientifically Designed
Delivery guaranteed against
static pressure resistance
Quiet as a Gentle Breeze**

THE Miles Centrifugal Blower is the only blower designed strictly for direct heat transmission. It is the only Blower equipped with Miles patented by-pass louvers which provide **FREE AREA FOR GRAVITY** flow when the fan is not running. This feature protects heater from possible damage due to carelessness or neglect. You can safely and instantly drop from maximum to minimum heat with a Miles Blower.

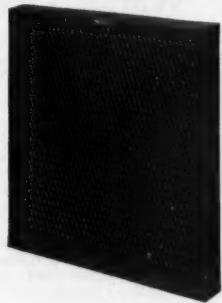
But more than that the Miles Blower gives *guaranteed delivery* of air against specific resistance. If you want to install the best by test, install a Miles Centrifugal Blower and you'll make your customers happy and a real profit for yourself.

And don't forget, the Miles Blower is adjustable for **COOLING** in summer—and flexible in *speed* to meet any requirement. It is shipped with or without motor. Any standard motor will serve.

**We Make A Complete Line Of
Blowers, Fans, Boosters**

No matter what you want in furnace fan service, you can get it in the Miles line, which embraces everything from Boosters at \$20 to Fans as high as \$350. Write at once for prices and other information.

The Warm Air Furnace Fan Co.
6511 Cedar Ave., Cleveland, Ohio.



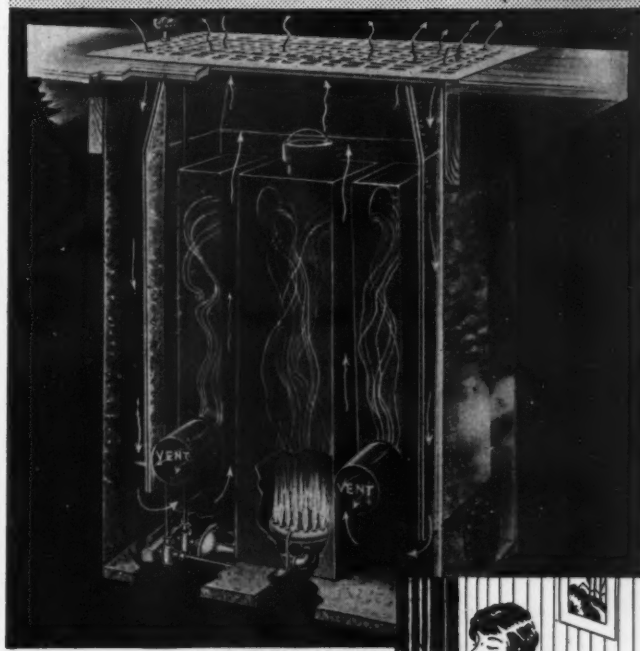
The Reed Furnace Filter

**DELIVERS CLEAN
FILTERED HEAT**

We are exclusive National
Distributors

*Demand grows as importance of AIR CONDITIONING
becomes more appreciated. Write for circular.*

PAYNE



GAS-FIRED VENTED



FLOOR FURNACE

Here is a low-priced, fast selling leader which not only pays you a handsome *first profit* but enables you to keep that profit! After service calls are practically *nil*... The Payne Furnace Franchise is a real asset. In these days of bitter competition and swiftly changing trends, it pays to line up with the leader. In the gas heating field, no other line compares with Payne—an outstanding success for fifteen years. Here is a real opportunity. Write for proposition.



**PAYNE FURNACE
& SUPPLY CO., INC.**
Beverly Hills, California

Warehouse—Buffalo, N. Y. • Jobbing Connections in Principal Cities
Dealers Everywhere

There's a Payne Heat System for Every Climate and Building

Mention AMERICAN ARTISAN in your reply—Thank you!

The AUTOMATIC DRIP HUMIDIFIER



Entirely Different
Write for Details

Correct and Controlled Humidity

THE Automatic Drip Humidifier is unlike all others. The amount of humidity desired is *regulated*. It is simple, fool-proof, durable, reliable and high grade in every respect.

For every warm air heating installation and especially desirable with oil heat because of control feature.

For efficiency and profits sell the Automatic Drip Humidifier—send for complete information today.

AUTOMATIC HUMIDIFIER COMPANY
CEDAR FALLS, IOWA

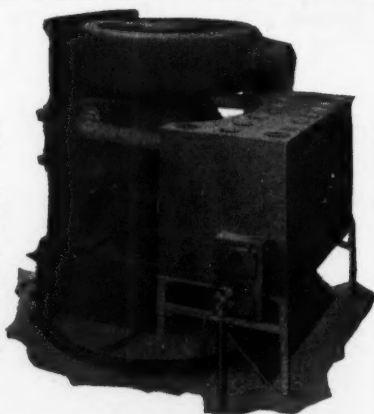
You can sell
GAS HEATING
to OLD as well
as new customers
with

The MUNKEL GAS ATTACHMENT

It fits any coal furnace—it heats both units giving extra large radiating surface. Simple, efficient, economical and easy to install. Stimulate business and make more profits with the Munkel Gas Attachment.

Write today for full details

The MUNKEL-RIPEL HEATING CO.
"31 Years of Service"
Columbus, Ohio



WATERBURY SEAMLESS FURNACE

REG. U.S. PAT. OFF. PIPE OR PIPELESS

The Waterman-Waterbury Co.
1122 Jackson Street N. E.
Minneapolis, Minn.

RUDY

UNQUESTIONED
QUALITY
INTELLIGENT
LEADERSHIP
CORRECT
ENGINEERING

Progressive Policies—
Fair Prices — Honest
Treatment

We will honor
your inquiry

RUDY FURNACE CO.
Dowagiac, Mich.



Rudy Air
Conditioning System

For Over Fifty Years the GILTEDGE FURNACE

has been famous for its high quality

Write today for catalog and agency details

SCHWAB FURNACE & MFG. CO.
283 Clinton Street Milwaukee, Wis.



Order a trial can now — it
will not sour — keeps any
length of time.

A new furnace paste FOR BETTER, NEATER AND QUICKER WORK

Non-Cereal—Non-Souring

Asbestos Paper will not absorb it as it does cereal pastes. Paper does not become soggy—not so apt to tear.

Larco Mineral Paste does not turn brown—no stains—mice will not touch it either when moist or dry and it does not gum up the hands. Larco Paste can be kept on hand mixed ready for use. It has greater covering qualities. It slips easily but adheres permanently.

Write for circular which tells all about it—get Larco prices.

WESTERN MINERAL PRODUCTS CO.

OMAHA (Formerly Larsen-Bennett Co.) NEBRASKA

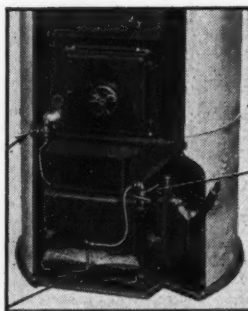
You can assure your customers 35
to 55% relative humidity with the

FARRIS WATERBASE FURNACE

Write for full details today

FARRIS FURNACE COMPANY
SPRINGFIELD Established 1899 ILLINOIS

Every Furnace User Wants One FURNACE DUST ELIMINATOR



MAKE a hit with your customers—include this patented feature on every new installation—costs little but makes the job of removing ashes a clean, easy task.

It prevents dust from spreading throughout the home—saves grates and fuel.

Fine nozzle spray settles the dust. A turn of the control valve before shaking or removing ashes does the trick. High quality throughout—easily attached.

Get full details and prices today—make extra profits this season.

DUSTLESS ASH COMPANY
MUSKEGON, MICHIGAN



WE now manufacture Furnace Pipe & Fittings from **ENDURO K-A-2 STAINLESS** Sheets, and like all of the Pipe & Fittings made in our own manufacturing plant, they are **GUARANTEED TO FIT** Enduro Products Are Long Lived.

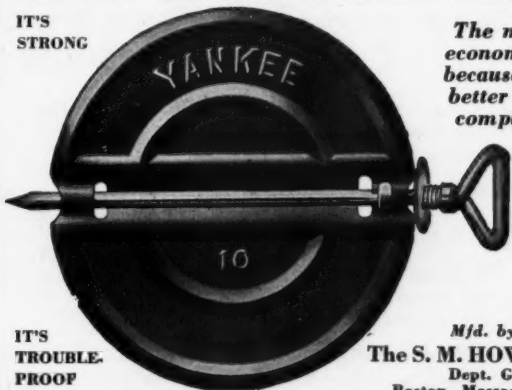
Ask for Prices

THE J. M. & L. A. OSBORNE CO.
Manufacturers-Distributors
DETROIT - CLEVELAND - BUFFALO
"Everything Used in Sheet Metal Work"

Osborn's Die Stamped Tee

HOWES YANKEE HOT-AIR DAMPER

IT'S STRONG



The most economical because it's better and complete

IT'S TROUBLE-PROOF

Mfd. by
The S. M. HOWES CO.
Dept. C.
Boston, Massachusetts

KU-NO New—Practical and finished in Two-Tone Colors
WARM AIR REGISTERS



ACCEPTED on sight by dealers and home owners. This new register construction is making a big hit. Its attractive two-tone color finishes are making many register replacement sales.

Face with wing attached is removable—snaps in and out of frame. New patented locking device holds wing in any position without jar or vibration.

It's the newest most practical register you've ever seen—write for samples of colors and circular.

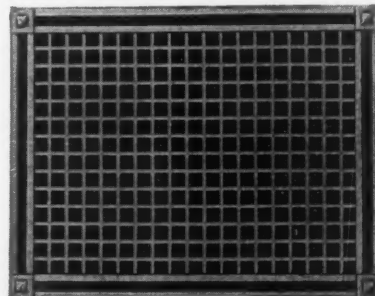
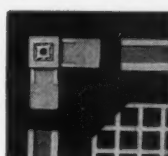
Sell attractiveness, air capacity, easy operation, and easy cleaning with the KU-NO Register. Give us your jobber's name

KU-NO REGISTER MFG. CO., ST. LOUIS, MO.

"American Seal"
FURNACE CEMENT
Roof Cement—Stove Putty
Plumbers Putty
PAINTS AND SPECIALTIES
WILLIAM CONNORS PAINT MFG. CO.
Established 1852
TROY NEW YORK
JAMES L. PERKINS, Western Distributor
140 South Dearborn Street, Chicago, Illinois

Grilframe
(Trade Mark)

THE NEW GRILLE CONSTRUCTION
Beautiful—Convenient—Economical

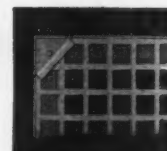



"Grilframe" parts ready for assembly (Front view)

"GRILFRAME" is completely assembled from stock parts. This new method makes possible 48 hour service

Distributors are being appointed in principal cities

SEND FOR CATALOG



Grille secured to frame with lug (Back view)

H & K GRILLES

H & K grilles are well known throughout the country and for excellence of workmanship and beauty of design are not surpassed. Grilframe construction is adapted to all of H & K grille designs and rounds out the line of our punched metal grilles. Ask for catalog No. 28.

PERFORATED METAL

EVERY type of perforated metal from the finest to the largest standard sizes are within the scope of our equipment. This means round, oblong, slot, square holes and many special shapes suitable for metal of different kinds and thicknesses.

Write us for perforated metal of every sort

THE HARRINGTON & KING PERFORATING COMPANY
5649 Fillmore Street Chicago, Ill.
New York Office: 114 Liberty Street

Founded 1880

American Artisan

THE WARM AIR HEATING
AND SHEET METAL JOURNALPublished Every
Other SaturdayCovering All Activities
INGravity Warm Air Heating
Forced Warm Air Heating
Sheet Metal Contracting
Air Conditioning
Industrial Roofing
Merchandising
Ventilating

We hope you'll like the article on factory heating by Platte Overton. There is more meat in that story than in many entire issues. There's real engineering there, too. Any of you readers who want to get into that kind of heating, or are doing it now, ought to have lots of questions. You write them and we will answer them.

* * *

This discussion of applying overhead is getting up steam. In addition to the rebuttal to Dingle published in this issue we have two more all ready to shoot. It's not too late to express your opinions and experiences. The more replies the farther we'll get toward settlement. Send them along.

* * *

By all means look over that troubleshooter article. This home owner has really said, "Put up or shut up." We certainly need your help on this. If you think you know the remedy for those three heat-bound rooms send us a sketch and explanation. Let's show these owners that we know our B.t.u.'s.

YEARLY SUBSCRIPTION PRICE:

United States	\$2.00
Canada	\$3.00
Foreign	\$4.00
Single Copies	25c

VOL. 99, NO. 21

OCTOBER 11, 1930

Contents

	Page
Gas Furnaces and the Furnace Man	25
<i>An editorial.</i>	
Overhead	26
<i>Evidently all our readers do not agree with J. G. Dingle that overhead should be applied on labor and materials. Benjamin F. John doesn't agree and tells why.</i>	
A High-Type Gas Furnace Installation	28
<i>Full details of an excellent gas fired installation designed by B. L. Schwartz of Pittsburgh.</i>	
A Two-Piece, 90 Degree Elbow	33
<i>W. R. Haines, our contributing editor, works out a pattern for a simple elbow of just two parts.</i>	
Factory Warm Air Heating	34
<i>Platte Overton, consulting engineer, explains a simplified system for designing a fan blast factory heating installation.</i>	
Cost of Handling Salesmen's Cars	39
<i>Here are some figures on what it costs to help buy and operate salesmen's cars. Are your's higher or lower?</i>	
An Aluminum and Copper Marquise	40
<i>An interesting marquise erected by Herrmann and Grace of Brooklyn. Several unusual features were incorporated in the design and erection.</i>	
All in a Day's Work	43
<i>Salesmen do write letters. Some of them are excellent pieces of psychology. We hope none of our readers were parties to this particular skirmish.</i>	
A Problem for the Troubleshooters	44
<i>Here is a good one. A home owner has actually agreed to make whatever changes the entire warm air heating industry recommends. We want lots of solutions, but we hope you fellows show some uniformity.</i>	
Sheet Metal in the Auto Industry	46
<i>An account of how these automobiles we ride around in are designed in sheet metal.</i>	
This Week's Letters	48
Random Notes and Sketches	49
Notes and Queries	50
Association Activities	52
New Items and News Items	54

Copyright 1930 by

PORTER-SPOFFORD-LANGTRY CORPORATION

139 North Clark Street, Chicago— Telephone Central 7670

Fred D. Porter, President

John C. Langtry, Vice-President

Howard H. Bede, Secretary

Editor: Joseph D. Wilder

Business Manager: Etta Cohn

Circulation Manager: John R. Hannon

Advertising Representatives: Charles E. Kennedy and J. F. Johnson

New York Office: 295 Madison Avenue, Room 1109, Tel Ashland 5342—Frank G. Cambria, Eastern Representative

Important news~

DUO-WELD BOILER PLATE HEATERS

**2 welds instead of 1
for double strength & service**

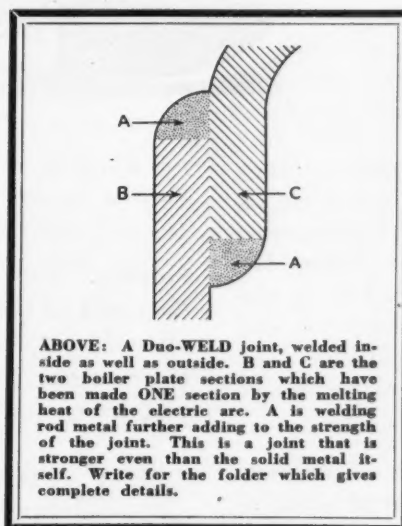


**MADE by the MAKERS of PREMIER DE LUXE—
THE KING of THEM ALL!**

HERE we are! A steel furnace by Premier. It wasn't an easy job to make Duo-WELD the sort of furnace we wanted. Fact of the matter is, it took six months just to get started. But the time was well spent for we got what we were after—a steel furnace that is just a little bit better than anything yet produced. And here's why!

All along the biggest problem was to get a joint that would stand up under intense heat. In a cast furnace you can make provision for expansion. Witness the new "floating flange joint" of the New "E Series" Premier De-Luxe. But a steel furnace, being made of plates, can't be built that way. Every joint must be just as strong and expansion-proof as possible. Because if a joint gives way, it's just goodbye to the whole furnace.

In building Duo-WELD, this weakness of the ordinary furnace was overcome by double welding the joints, welding them inside as well as outside. What makes the joints even more binding is the fact that



the welding is done electrically. The result of all this in a nut-shell is that Duo-WELD JOINTS ARE STRONGER EVEN THAN THE SOLID PLATE ITSELF, OVER 100% STRONG.

It's a little bit more expensive to weld twice, to be sure, but it's worth it to give you a better steel furnace. The 10-Year Guarantee that is placed on Duo-WELD is just a matter of form. With even a half-way decent installation they are good for two and three times that length of time.

Just one more point. Duo-WELD is Premier Made and Premier Sold. We could have jobbed other makes of steels, but the furnace industry looks to Premier for a better and different furnace and so there is Duo-WELD. Now you can buy a highest quality cast and a highest quality steel from one source of supply. AND BECAUSE PREMIER ACTUALLY MAKES THEM BOTH, RESPONSIBILITY IS UNDIVIDED.

**PREMIER
WARM AIR HEATER CO.
Dowagiac, Michigan, U. S. A.**

"Makers of Furnaces with All the Famous Features"

Say you saw it in AMERICAN ARTISAN—Thank you!

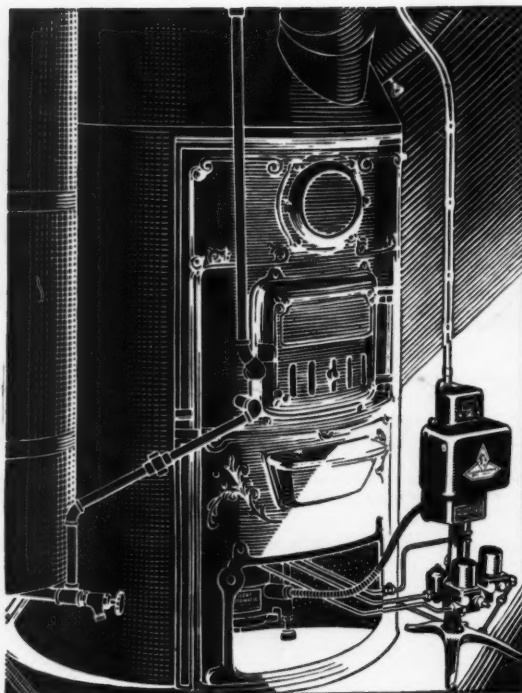
A two-cent stamp will bring you a folder completely illustrating and describing Duo-WELD. There is no obligation and a Premier Man will not call unless requested by you. Write for the folder today.

How "SILENT" oil heat serves the WARM AIR FURNACE MAN

IN the Silent Automatic oil burner there is no power fan or anything else to cause mechanical noise. Moreover, combustion roar is eliminated because there is a minimum of excess air. Silent Automatic is *truly* SILENT... and *you* know how important this is.

Your customers... and this includes every heating system you ever have installed or ever will install... are interested only in *results*. You want *profits*. It's only natural that you... a heating specialist... should *complete* every job with a Silent Automatic. You will gain many *satisfied* customers, build your reputation, and *make two profits* on every job.

Remember that 28% of all Silent Automatic installations are made in warm air



For Warm Air, Steam and Hot Water Heating Systems — Old or New Homes

furnaces. Don't forget that "Silent" leads the world in the production of domestic oil burners. And, above all, don't fail to investigate "Silent" NOW. The coupon will bring you complete information.

SILENT AUTOMATIC CORPORATION
12001 East Jefferson Avenue Detroit, Mich.

C O U P O N

SILENT AUTOMATIC CORPORATION

I'm interested in everything you can tell me about Silent Automatic and its profit-building application to my business.

Name _____

Company _____

Address _____

City _____ State _____

SILENT AUTOMATIC



THE NOISELESS OIL BURNER

(358)

Made by the World's Largest Producer of Domestic Oil Burners

Say you saw it in AMERICAN ARTISAN—Thank you!



American Artisan

THE WARM AIR HEATING
AND SHEET METAL JOURNAL



Vol. 99

CHICAGO, OCTOBER 11, 1930

No. 21

Gas Furnaces and the Furnace Man

AS this issue of the AMERICAN ARTISAN goes to press, men in all parts of the country interested in gas heating are leaving for the annual American Gas Association convention to be held in Atlantic City, October 13, 14, 15, 16, 17. Pre-convention reports indicate that this year's meeting will be the biggest and most interesting program yet held.

Within just the last few years gas heating has made tremendous advances as a convenient method for house heating. True, much of this advance has been due to the coming of natural gas, for on artificial rates and B.t.u. content gas is too expensive for the average home owner. Gas furnaces have been improved and made more efficient, but the lessons learned from warm air heating in the handling of air by fan propulsion, humidification, filtering and location of outlets and in-takes have been an even more important factor in gas' advancement to popularity.

Where is the warm air heating man going to fit into the picture of gas heating? Probably the only persons who really know are the warm air heating men themselves. It would seem that here and there over the country, especially in those communities where natural gas is being sold home owners, a new type of warm air heating man—a heating engineer—if you will, is coming into existence.

This new type engineer, is not, in every case, a specially trained heating engineer. In many, many instances he is a warm air heating contractor who has stepped out of the low-priced, competitive field and has cast his lot among home owners who are willing to spend real money for convenience in heating.

There can be little question to the statement that the American public is interested in convenient heating. Our own Jack Stowell probably wouldn't call this convenient heating—but laziness. But call it what you will, it is a profitable frame of mind for the warm air heating contractor who is prepared to sell heating equipment to the man who has the money, but who demands and will have nothing but the very best there is in heating equipment.

There should be no necessity for relating all the fields this use of gas opens up to the heating con-

tractor. It can all be illustrated by the description of a typical gas-fired warm air heating plant, such as described in this issue. The gas furnace, in this job, was only the beginning. The home owner, once his mind is made up to have this kind of equipment, is a live prospect for all the improvements in warm air heating we know about, but can't interest the average home owner in.

Every such system logically requires some type of pressure fan; filters; automatic controls, both house and furnace; adequate and automatic humidification; and rectangular ducts to carry the warm air from the furnace to the stacks and registers. This means more costly installations and more profitable installations.

In many instances the warm air heating man does not have to do his own missionary selling. The sellers of gas furnaces and gas fuel are anxious to get the prospects if they are confident that at least one contractor can design and install a system which will require no attention or service cost.

The warm air heating contractor is the logical and at this time, at least, the only individual able and equipped to give such co-operative service.

This present trend, if carried to its logical conclusion, means the setting up of a selling service to bring in and interest the prospect and a second organization which can lay out the system according to the demands of the house and the locality.

Warm air heating contractors are able and ready to assume their part in this heating picture. It remains for those interested in the manufacture and sale of gas equipment and gas to see that this solution is both logical and timely.

Matters might be hastened if those heating contractors who feel themselves able to do the designing and installation of these systems made known their qualifications. There can be nothing gained by silence.

The public is ready for this new type of heating. They want to know that the equipment they buy is the best, but more important they want to be sure that the equipment will be engineered to their particular problems.

Co-operation between these two closely allied, but oftentimes two-way pulling interests, is what is needed.

OVERHEAD

"It Should Be Figured On Only Productive Labor"

THAT article on Overhead by Joseph G. Dingle, in the September 27 issue, interested me very much indeed. His whole series have been instructive and the articles show a decided grasp of the problems of the warm air heating and sheet metal contractor. However, on this matter of figuring Overhead, I do *not* agree with Mr. Dingle.

I would like to explain that during the years the Philadelphia Association has been operating, we have made the most exhaustive study of this matter of placing overhead. We have tried out every method we ever heard of and a lot more we worked out to fit the needs of some particular shop. But, after all the experiments were completed, we have been forced to conclude that the *simplest*, the *most certain* and the *most uniform* method of figuring Overhead is to figure it on Productive Labor.

I'd like to explain why.

The only reason for figuring Overhead (yearly expenses) by finding its percentage of some other cost item, is because it would be almost impossible to list all the varied and numerous expenses of one year. These expenses vary greatly from year to year, and to divide them into small amounts and add in correct proportion to each bill sent, or each estimate given, would require an enormous amount of time that would be wasted.

There are in general use in the Sheet Metal, Roofing and Warm Air Heating trades three methods of finding this percentage:

1. Yearly expense divided by the yearly cost of charged material and labor.

2. Yearly expense divided by the yearly cost of charged productive labor alone.

3. Yearly expense divided by the yearly gross (total) business.

From this division a percentage is obtained which, when used to find an amount with which the expense is divided on each bill or estimate, represents the portion of the yearly expense that the bill should bear. If *all* these expense amounts on *all* the bills for the year are added together, the total *should* equal the expense for the year.

It is important to remember that the amount of expense for the coming year cannot be foretold exactly, and the amount of this expense does differ yearly.

In order therefore that the expense for the coming year may be estimated to cover *all* the expense, it should be computed from an average business cycle, or in other words, from the present records for

BENJAMIN F. JOHN

two, three, five or more previous years.

The more years used, the better.

Any shop owner who has been in business for less than three years, will do well to seek advice from his local or national trade association, and have them put him in touch with shops doing the same nature of business and under about the same conditions. Such shops should also have approximately the same yearly gross business.

The shop that has been in business three years or more, and has kept records, is in a position to find its own expense percentage.

To determine the correct method of figuring overhead by percentage, it is necessary to know just where all the money spent during the year has gone. We must also prove certain facts and conclusions before deciding upon a cost item to divide into the expense item.



This is a free-for-all argument. How do you think Overhead should be applied? If you have any ideas, sit down and write us.

There are three items for which money is spent during the year:

1. Material.
2. Productive Labor.
3. THE BALANCE.

And just by way of explanation: Any shop that knows the total amount of money spent for *everything* legitimately connected with the business for one year, and will deduct the amounts spent for Labor and Material charged in the Ledger; Material in stock at the end of the year and purchased that year; and the amount paid for any additional machinery, tools or equipment for the office that has a value at the end of the year and was purchased during the year, will find that the balance is the amount that must be returned to the business before any profit can be made.

That amount is the expense, overhead, loading charge or whatever you choose to call it.

This cost item, which is to be divided into the expense item, to find a percentage to work with, must, therefore, bear a regular and proportionate rise and fall with the expense item for the average cycle computed, if the desired results are to be obtained.

The reason for this is that the figuring of overhead by a percentage of some cost item on the bill gives an amount that represents *only* a certain portion of the expense as compared *only* with that item of cost, and has nothing whatever to do with the investment (cost) of the bill before the expense is added.

This can easily be proven by making a list of the costs of material, labor and expense of any shop and comparing them for three to five years and comparing these items by months.

The following list has been taken from the records of six different shops, Table 1:

Numbers 1, 2 and 3 represent the same shop over a period of three years. Numbers 9 and 10, one shop for two years, and these two years are a representative average of over ten years.

Referring to Numbers 1 and 2, it will be noted that the expense between two years differs \$477.40; the labor differs \$332.51 and the material differs \$2,010.18. This difference is the same in Number 3.

We are not discussing profit now, therefore, any of these statements that show a loss, do so because of labor and material that was missed

Now consider labor as compared with expense and note the regularity between it and expense during three years, in fact the whole ten statements as shown.

Peculiar to this business, it has been found by those who have studied overhead and how to apply it, that there is but one staple item upon which dependence can be

TABLE 1

	Material	Labor	Overhead Expense	Gross Business
1.....	\$ 4,653.76	\$ 4,637.72	\$ 6,636.00	\$16,693.19
2.....	2,643.58	4,305.57	6,188.30	13,066.95
3.....	7,062.46	5,076.02	4,652.38	16,583.41
4.....	1,638.76	2,106.59	2,660.98	5,943.25
5.....	9,709.68	5,222.49	5,047.26	23,251.82
6.....	3,217.03	2,361.70	2,738.18	10,081.57
7.....	3,772.04	2,362.42	2,073.65	9,708.23
8.....	7,073.71	7,314.30	9,874.00	26,020.08
9.....	36,274.65	22,529.01	21,742.13	86,102.52
10.....	22,160.70	28,610.26	27,421.61	85,402.69

being charged where used on the Job Sheet. This naturally ate into the profit expected (more about this another time). But we are only interested in what happened when the overhead was applied, if applied according to the previous years records.

All these shops figured their overhead applied to Productive Labor alone.

Note the material item difference in Number 3 because of the demand for higher priced material; Number 2 because labor was sold in a larger proportion as compared with Number 3; Number 1 both were regular. None of which could be foretold for the coming year. And this is not unusual.

If then Number 1 had charged 71 per cent of labor and material, the expense would have been covered, but if Number 2 had assumed 71 per cent as a basis, figured on the year before, of labor and material, the expense would have been short \$1,254.48. Then, again, Number 3 by using the same percentage the third year would have shown a large gain in expense, and would have undoubtedly put the shop out of the running when estimating, because estimates were too high.

based to gain a nearly accurate return through a percentage.

That is labor.

This item, labor, varies with the expense as it rises and falls. This is shown by the ten statements. No other item nearly represents this feature, with the exception of very few instances where one class of material was used and the labor the same, as in blow pipe and ventilating work alone, and even in some of these a large variation was found.

Numbers 1, 2 and 3 give a statement of the average shop doing all kinds of work and using all priced material. Some years the records show high material purchases and other years low, and an average cannot be computed with fairness to the owner or customer. Out of 60 shops thus examined for a number of years, the material item varied as much as 50 per cent from one year to another, while the labor item was steady.

Numbers 9 and 10 are taken from a larger shop, where a division was made between outside and inside work and both charged 100 per cent on productive labor.

If, then, the material item does
(Continued on page 42)



This is the outside of the house. The exterior does not correspond with the floor plan in the entrance location. Otherwise the plan fits the house

AS natural gas pipe lines are extended into more communities, the warm air heating man is more frequently being called upon to figure gas furnace jobs for home owners. This is true in both the community where natural gas is burned as it comes from the pipe line and where it is mixed with artificial gas.

This advent of the gas furnace brings with it two very decided changes in heating. First, the use of the gas furnace makes it possible for the heating man to sell a higher priced installation, and, second, it makes the use of fans, automatic controls, automatic humidifiers, flat ducts and filters almost essential. This means that the installation costs more money and makes it possible for the contractor

to figure in a profit from a number of items other than the furnace itself.

Installing a gas furnace with such accessories as fans, ducts, filters requires more specialized knowledge than the usual gravity job. These installations, to be efficient, must take into account all the heat losses, infiltration, duct capacities and losses, fan efficiency and automatic control. These must be thoroughly understood and correctly installed if the plant is to render the best service and operate without service expense.

Shown on these pages are some views and heating plans for a large brick house in Pittsburgh. This house is heated by a very excellent gas furnace to which are attached all the accessories mentioned above. The arrangement of the heating

This Gas Furnace Flat Ducts

plant and the placing of the warm air outlets and return grilles has been worked out in excellent manner.

This installation is the work of the Schwartz Furnace Company, Pittsburgh. We have already reported a couple of this company's excellent jobs. B. L. Schwartz, who manages the company, is a graduate engineer, who became interested in heating and is now specializing in gas furnace installation in large houses. Most of his work is replacement, but he has some new work which is mighty interesting.

The efficiency of the system was demonstrated last winter when a period of unusual and severe exposure was undergone.

At that time, during a period of intense cold, a death occurred in the family and during the week following the house was constantly visited by a stream of callers. The funeral was held in the house and all during this week the front doors were open much of the time and extra ventilation through the windows and other doors called for instant control of the furnace and capacity for extra heat. Never once did the furnace fall down on the job and in spite of open doors and windows the house was comfortable all during this time.

One reason for this is the location of the first floor thermostat. This thermostat is located in the front hall, one of the coldest rooms in the house and in the case of this particular house and its week of severe

With Forced Air, Thermo Control Provides Automatic Heating

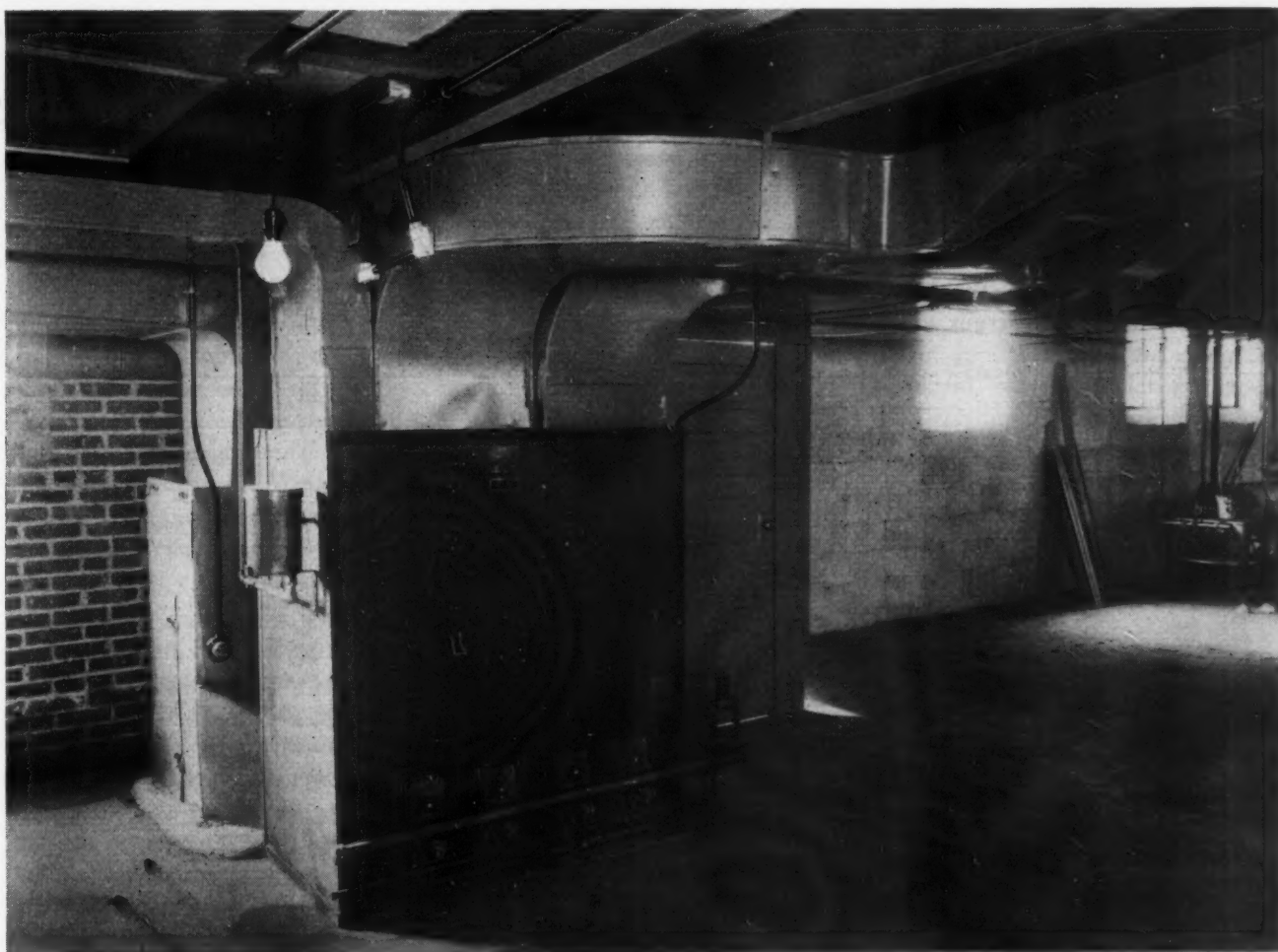
exposure, the best location possible. Because of the extra amount of cold air entering the hall the thermostat called for heat practically all the time which kept the rest of the house warm in spite of open windows and doors.

The system itself is an excellent piece of warm air engineering. One

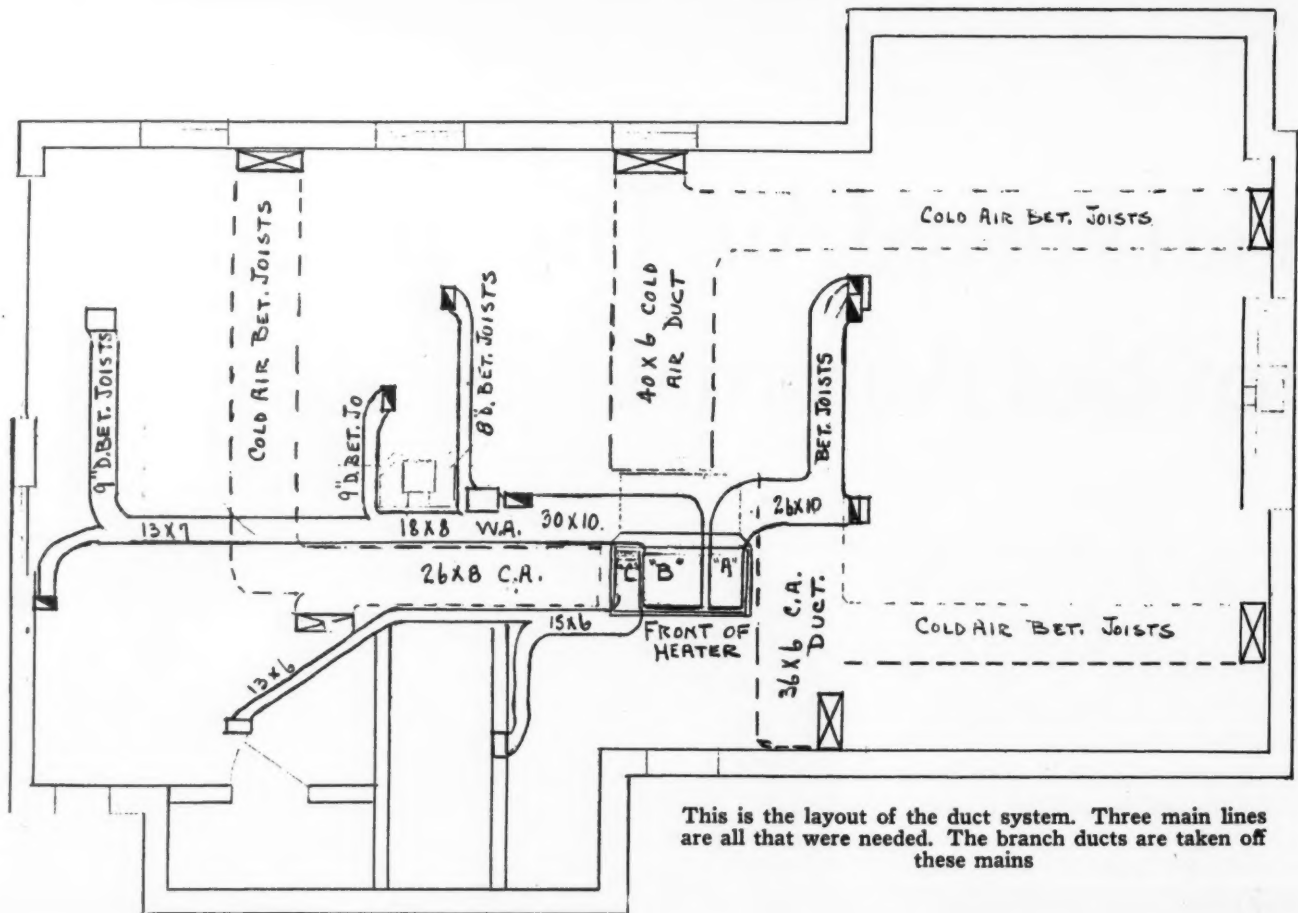
of the illustrations shows the furnace and the flat ducts which carry the warm air into the house and the return air back to the furnace. The shiny appearance of this duct work is due to paint applied to the exterior. All the jobs which Mr. Schwartz does are so painted. The cost is only a small part of the bill,

but the appearance is such that the owner is very proud of his furnace and thoroughly sold on the flat duct installation.

All these ducts are as flat as possible. This permits holding the ducts up against the joists and increases the usable headroom of the basement. Since a fan is used, the



This is the gas furnace shown on the cover. Just notice the excellent duct work. These ducts are painted and can be cleaned off just like a piece of furniture. They are so cleaned, too. The fan and filters are behind the furnace



furnace is placed out of the way; in this case in the center of the basement from front to back, but against the outside wall where space was not needed.

The basement plan shows that the system is as compact as the large area of the house will permit. On the warm air side only three main ducts are taken off the furnace. One of these goes to the inside living wall where it exhausts through two baseboard registers into the living room and through three baseboard registers in the master bedroom and the bath on the second floor.

The second, and longest warm air duct, heats the back of the house, where it furnishes air for the dining room, hall, kitchen and breakfast room on the first floor and study, guest room, bath and hall on the second floor. This second main line has two interesting features. The hall-dining room and the kitchen-breakfast room on the first floor are heated by a double side wall register opening from a single lead.

The first one of these double registers is taken off the duct line close up to the furnace, but the second one is taken off the end of a long branch which extends out toward the side of the house.

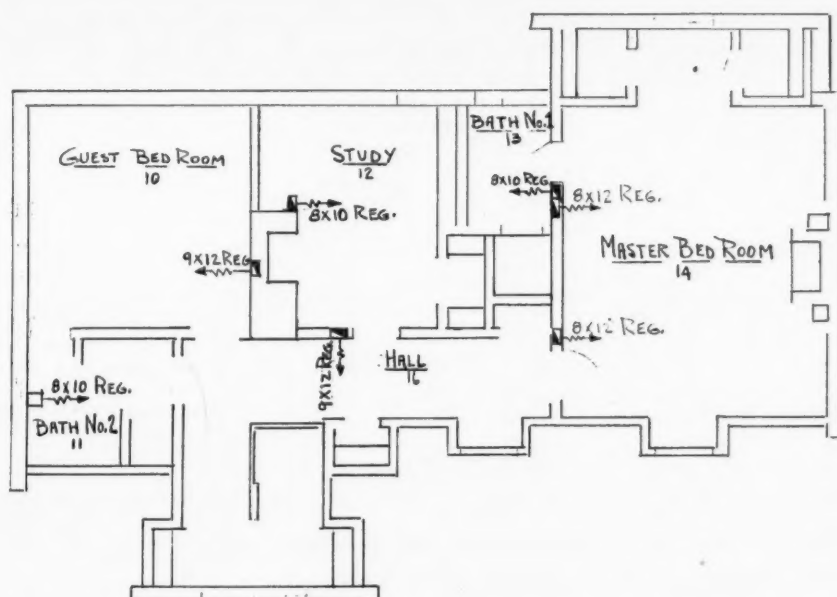
The third main duct is a relatively small affair which is used for the first floor bath and rear hall. Because of the location of the return air duct from the back side of the house it was cheaper to build a separate duct for these two rooms than to take leads off the second main duct and jump the return air duct. It probably was more efficient also.

The heart of the system is a Bryant furnace with a capacity of 140,800 B.t.u. To the furnace is hooked a 1000 Miles fan with louvres attached. The fan is housed in a separate return air box into which the air from the three return air ducts dump. In the top of the fan housing provision is made for four Reed filters. These are placed flat above the fan and are so arranged under the return air duct

openings, or rather the return air duct openings are so designed that the entire surface of the filters are in use. This makes the periods between cleaning longer and the operation more efficient.

The return air side of the system has been carefully worked out to insure uniform movement of cooled air from all parts of the house, especially from the north and front. Three main lines constitute the system. Into these three lines six floor grilles, all on the first floor, empty. No return air is taken from the second floor.

In the living room, which covers the entire front of the house there are two warm air registers opening through the inside wall. The air from these travels across the room and returns to the fan through two floor grilles located under the front windows. By referring to the data sheet, which is reproduced, we find that the cubic content of the living room is 2,091 cubic feet. There are 48 square feet of glass and 222 square feet of wall area. The fac-



There are no return airs from the second floor. Each room has one warm air outlet and the master chamber has two

tors used for this house are 1.1 for the glass, .2 for the wall, which is brick, .3 for the ceiling, which is not counted in the living room, and .02 for infiltration. The temperature difference is 0 to 70 or 70 degrees rise. Multiplying by these

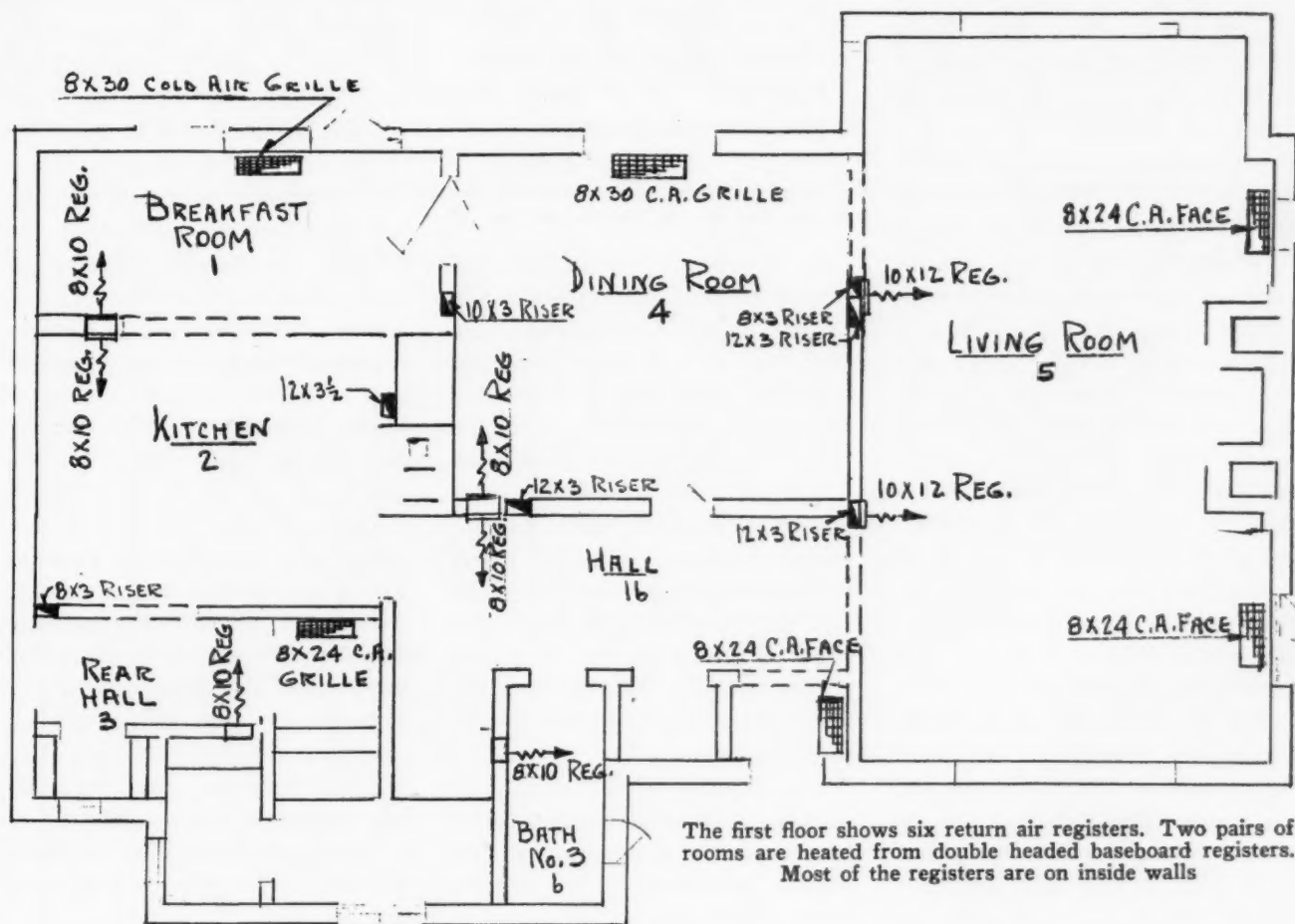
factors we get a heat loss of 9,730 B.t.u. for the living room. This is supplied by the two 10 by 12-inch outlets from the 26 by 10-inch main duct from which three other second floor stacks are taken as well.

The same factors are used in the

other rooms of the house. In the dining room circulation is assured by a warm air outlet located on the inside wall and a return air grille located under the outside window on the other side of the room. This room requires 1,590 B.t.u.'s. This is supplied by the 8 by 10-inch register.

In the breakfast room and the kitchen one double head baseboard register brings the warm air from the main duct. Both these outlets are located rather close to the outside, back wall of the house, a feature which would be impractical with a gravity system. With the fan system, however, matters of location can be determined on the basis of best location for the furnishings of the rooms rather than for the needs of the heating plant.

Provision for carrying off cold air is well cared for by placing a return air grille in the rear hall and the stair hall. The warm air sources for these rooms are base-board registers. In the rear hall this register opens from the wall



The first floor shows six return air registers. Two pairs of rooms are heated from double headed baseboard registers. Most of the registers are on inside walls

SCHWARTZ FURNACE COMPANY
PITTSBURGH, PA.
ENGINEERING DATA SHEET

FIGURED BY AB CH'K'D BY BA DESIGNED FOR M. LEFELTER CONTRACTORS SCHWARTZ FURNACE Co.
SHEET NO. 1 DATE JULY 15-1929 348 S. WINEBIDDLE AVE. 2336 CARSON ST.

NO.	ROOM	DIMENSION	CUB. CONT.	C. F. M.	SEMT. W.A.	RISER W.A.	COLD AIR	GLASS	WALL	FLOOR	CEILING	INFIL.	SOIL	TEMP. DIFF.	B.T.U. LOSS	B.T.U. FOR VENT	GRADE AREA	RES. TEMP.	PAN. NO.
1	HALL		2546		109			49	414	198	2546			70°	17360			126°	
2	LIVING		2091		61			48	222		2091				9730				*1000
3	DINING		1570		35			24	104		1570				8530				Miles
4	KITCHEN		1035		54			45	244		1035				8470				L.S.
5	BEN		748		39			45	17		748				6160				
6	LAV.		85		7			6	37		85				1120				
7	BED		1616		67	54		36	297	101	1616				11410				
8	BATH		407		15	12		12	40	25	407				2590				
9	BATH		407		15	12		12	40	25	407				2590				
10	BED		1017		42	36		30	153	63	1017				7210				
11	"		1689		84	67		45	280	209	1689				14210				
12	"		748		42	36		16	209	100	748				7350				
13	"		825		44	35		16	216	107	825				7700				
14			15,920		616										101,430 heat loss				
15															10,143 = 10% safety factor				
16															111,573 B.T.U. DELIVERY				
17																			
18																			
19																			
20																			
21																			
22																			
23																			
24																			

C. F. M. = $\frac{111,573 \times 55}{70} = 87,664$ C.F.M.
 = 1461 C.F.M.
 USE #1000 L.S. MILES (CAP. 1600 C.F.M.)
 USE #40 BRYANT GAS FURNACE (CAP. = 140,800 B.T.U.)
 USE FOUR REED AIR FILTERS - TYPE "B" - 16" x 25"

This is the data sheet for the job. From this all the capacities were figured on a B.t.u. basis. This data sheet is the very heart of these engineered heating jobs. Once each room is accounted for and all contingencies taken into consideration the engineer knows that the system is going to heat

across from the return air grille. In the front hall the warm air outlet is one side of a double head outlet exhausting from a basement leader having 109 square inches of area.

In the rooms of the second floor another source of heat loss is considered in the ceiling. This ceiling is not insulated and the unheated attic is a source of constant and heavy loss.

All the details of the calculations for heat supply to the second floor are shown in the data sheet. It will be noted that while a very uniform range of sizes in registers is used, the stacks supplying these registers vary somewhat in area. This is due in part to the circumstances in the basement and the allowable space in the partitions. It will also be noted that the stacks are figured as 80 per cent of the area of the connecting basement leader.

The total heat loss which is balanced by the amount of warm air supplied is 101,430 B.t.u. To this total 10 per cent is added as a safety factor for extra cold days or decreased gas pressure. This makes the amount of heat units supplied the rooms 111,573 B.t.u. The capacity of the furnace is 140,800 B.t.u. which is more than ample for any emergency.

In reporting these gas furnace jobs we try to cover all the details we think of interest. Are we forgetting some things you readers want to know? If so send us your suggestions.

—The Editor.

In determining the influence of the fan in the system, the formula for this is that one cubic foot of air carries 55 B.t.u. of heat. Then the total B.t.u. used times 55 divided by 70, the temperature rise, gives the cubic feet per hour to be delivered by the fan. This gives 87,664 cubic feet per hour or 1,461 cubic feet per minute. The capacity of the fan is 1,600 cubic feet per minute, so the fan, like the furnace, is more than ample for the demands which may be made on it. This permits the fan to be operated at slow speeds, reducing noise.

The operation of the fan is automatic. An upstairs thermostat is located in the front hall, as explained previously. In addition there is a furnace control located in

one of the main warm air ducts just off the furnace. Locating the control here keeps it away from the radiant heat. This bonnet control operates the fan. The fan cannot go on until the burners have brought the temperature inside the furnace to an established temperature. This prevents the fan blowing cold air into the house. In addition the fan operates after the burner shuts off. Ordinarily the temperature begins to drop as the burner shuts off. The fan continues to run until it has brought the furnace temperature down. Then the fan shuts off.

One of the interesting features of this job is its economical operation. The rate for natural gas containing 1,100 B.t.u. in Pittsburgh is 60 cents per 1,000 cubic feet. The highest gas bill for the severe month of January when the funeral occurred was only \$26.50. This included the domestic use of gas for cooking, etc., which would make the cost of the furnace about \$22.00 for this month. Though the rate is low as compared to artificial gas, the low cost speaks well for the efficiency of the installation. Real engineering, covering all the possible contingencies, is the foundation on which Mr. Schwartz designed and installed this job.

Development of a Two-Piece 90 Degree Elbow

TO develop a two-piece 90° elbow, it is only necessary to draw two views of the elbow as shown by the sketch. Since the base of each segment is perpendicular to the axis, the base will therefore roll out in a straight line, or, in other words, the stretch-out will be a straight line.

The bottom view is simply a circle, with the diameter equal to the diameter of the pipe. This circle is divided into an equal number of parts. On this particular sketch, the circle was divided into twenty equal parts, as shown.

Each of the points on the bottom view was then projected to the front view as shown. The stretch-out was then drawn, equal in length to the circumference of the pipe (circumference is found by multiplying diameter by 3.1416). The corresponding divisions are shown on the stretch-out the same as the base or

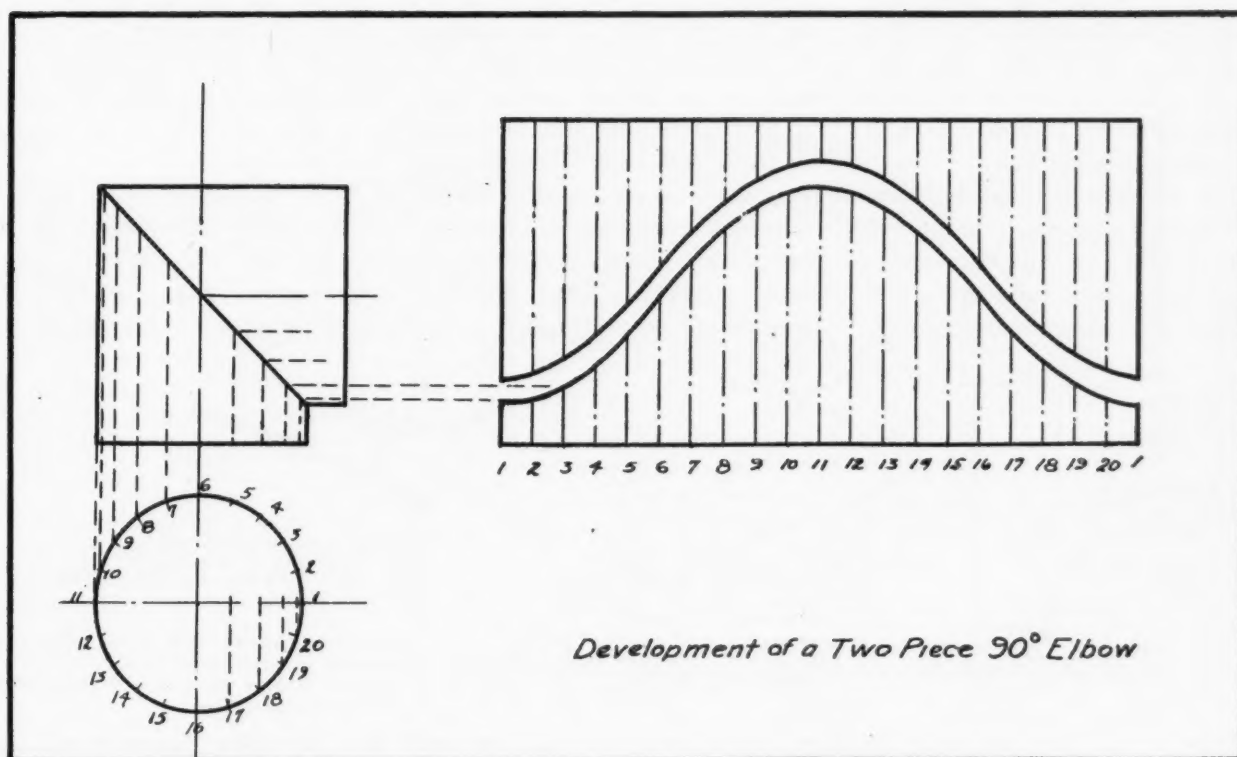
By W. R. HAINES
Contributing Editor

Most of these patterns are developed in response to requests from readers. We cannot develop patterns full size, but we can develop them to scale. We require at least one week and would like to have ten days to work out these patterns. If you would like to use this service, send us a good sketch and full details and we will give you a pattern promptly.

bottom view. From points 1, 2, 3, 4, 5, etc., on the stretch-out, vertical lines were drawn. The heights of these lines are shown on the front view. These lengths can be transferred either by projection or by the use of dividers. In this particular case, projection method was used for convenience. After the points had been projected, they were then connected with a smooth curve as shown.

It is only necessary to develop one-half of this elbow, since both halves are identical. No allowance for laps or joints are shown.

In this layout seams are shown in throat and back of elbow. If seams are desired in opposite sides, the above pattern can simply be moved over one-fourth of the length of the sheet. This elbow can be cut from a rectangular sheet of metal with no waste whatever. This is clearly shown on the drawing.



Factory Heating

BY A SIMPLIFIED ENGINEERING METHOD

By **PLATTE OVERTON**
Consulting Engineer

FACTORY heating by warm air is rapidly finding favor with owners and managers as the better working conditions brought into the plant by a warm air heating system are more thoroughly understood and appreciated.

Heating factories, however, is somewhat more difficult than laying out a system for a house. In the first place the contractor must be sure he knows what conditions he will run up against and he must know what principles of forced air heating he can call upon to overcome the difficulties.

As a matter of fact, if a heating contractor is going to do this type of work he should know something about the fundamentals of fan blast engineering. If he does not, then he is certainly going to run into conditions which his house heating experience does not cover.

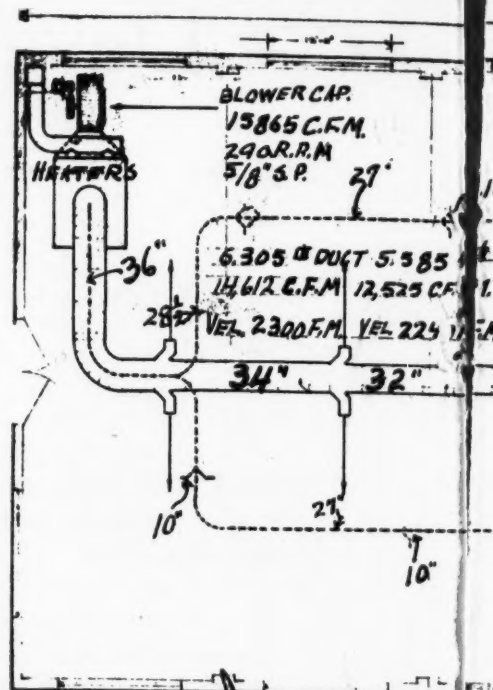
This is not to say that the average heating man can't do factory heating. He can. All he needs is some fundamental information and enough experience or available in-



Platte Overton

formation to guide him in laying out and putting in the heating plant and the duct system.

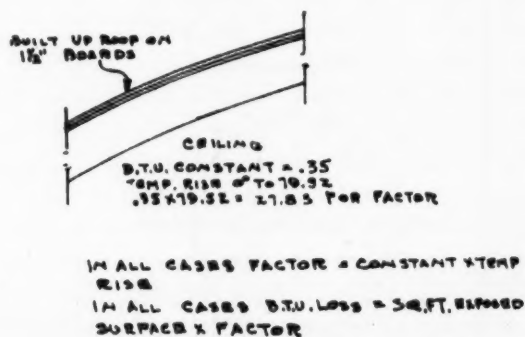
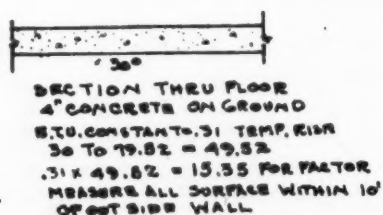
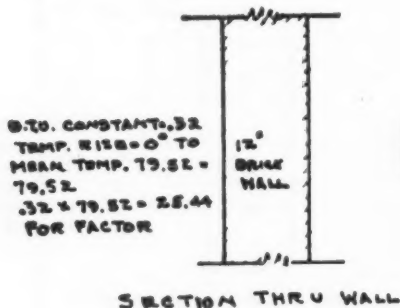
It is the purpose of this article and some others which will follow to take up a different type of building and give part of the heating data which should be considered in designing the heating system. Not all the information will be given, for that would require considerable more space than we want to devote to these different types of buildings. But as each different type of structure is pictured different data will be taken up and explained.



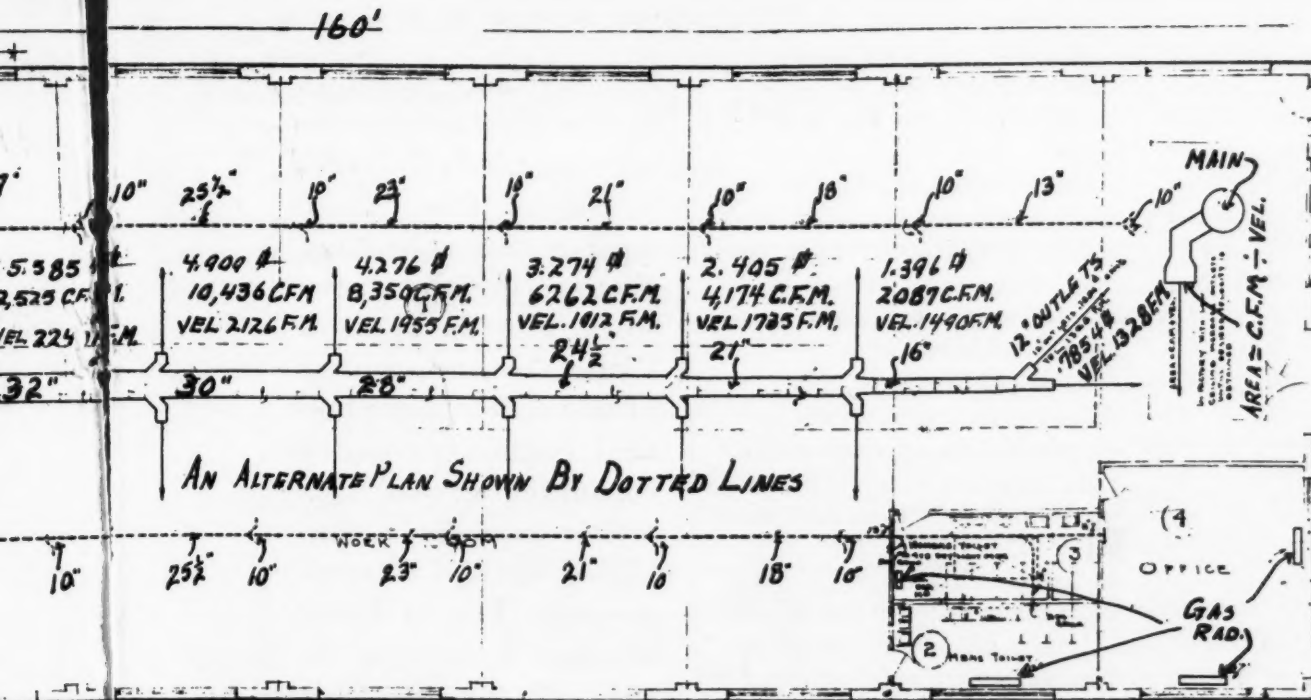
In this factory building I am going to discuss first of all that most important helper of the warm air heating man—the Data Sheet. Without this sheet, the contractor cannot be sure that he has itemized, considered and worked out every item necessary for a successful factory warm air heating system.

On this data sheet every item which must be taken into account is listed and the properly worked out figures put in the proper space. When the contractor has all these figures on the sheet he *will know* that the system is going to work—for there will be absolutely nothing left to chance.

This data sheet which has been found highly practical by numerous heating men is shown in one of the illustrations. The spaces have been properly filled in for the factory



These are the cross sections of the three principal sources of heat loss—wall, floor and ceiling. Losses have been scientifically determined by experiment so we can assume them correct in order to establish our factors and constants



Here is the completed duct system designed according to this simplified engineering method. Dampers are not needed unless the occupants want them to shut off some outlet. If the owner wants to spend more money he can adopt the two-trunk, alternate system which will supply a more even distribution of, but not better, heat

shown on another of the illustrations.

Let's work this job out item by item. First, let us work it out my way. Then, if you wish, you can work it out as you ordinarily would and we can compare notes. I shall be glad to discuss any contractor's method of figuring and explain in more detail any point which I do not make clear.

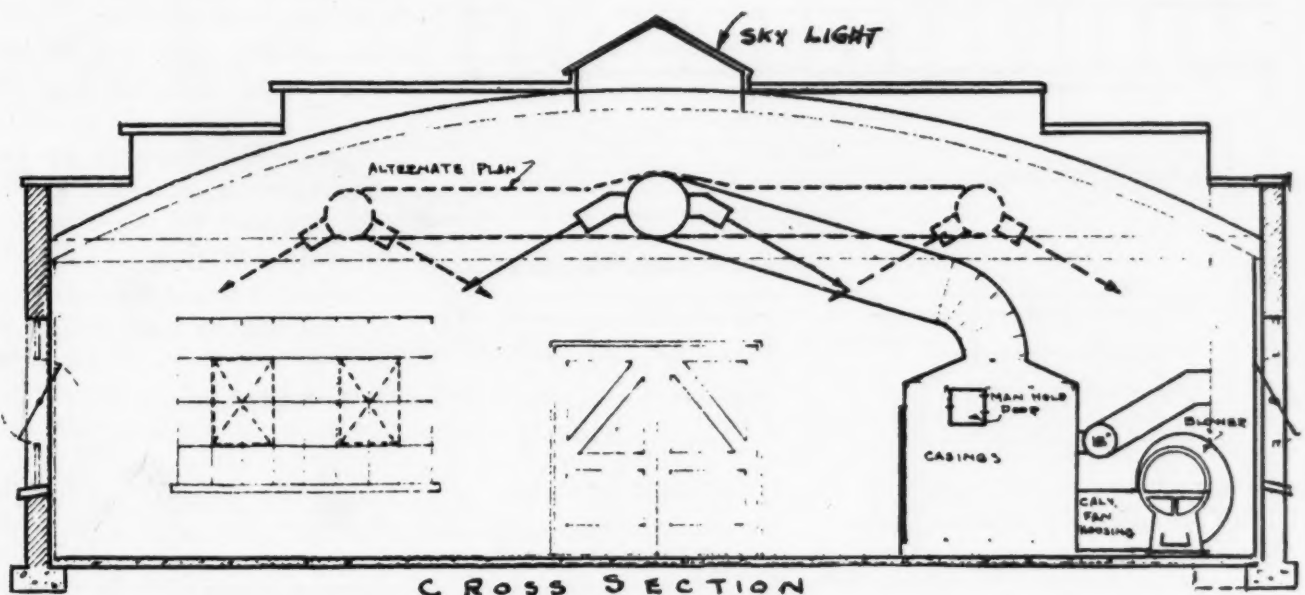
Our first move is to calculate the B. t. u. loss of the building. The

plan shows that the factory is 160 feet by 60 feet. It has a rounded roof which is an average of 18 feet high. This average height is the height halfway between the height of the eave and the height of the skylight. We notice on the data sheet that the building is divided into four rooms. The men's toilet, women's toilet and office are radiator heated so the areas of these are subtracted from the factory.

Items 1-2-3 on our sheet lists the

cubics of all rooms. This should be self-explanatory.

Item 4 is our floor constant and factor. One of the illustrations shows a cross section of a 4-inch floor. This thickness is standard in factory buildings. The B. t. u. constant for a 4-inch floor is .31. For our factor we multiply this constant by the temperature rise. So now we have to establish our temperature rise. The plans call for an interior temperature of 70 degrees,



This is the cross section of the building. The ceiling height is half the distance between eave and skylight. Heater and duct location are indicated

but due to the high ceiling, the mean temperature must be higher than 70 degrees.

To find the mean temperature the following rule is standard practice among engineers. Subtract 10 from the ceiling height. We know that our ceiling height is 18 feet. So 18 minus 10 equals 8. We multiply 8 by 0.017 and this equals .136. To this answer, .136 add the unit 1 and we have .136 plus 1 equals 1.136. We now multiply this 1.136 by the Breathing line temperature to be maintained and we have 1.136 times 70 and we get 79.52.

This 79.52 is our mean temperature.

As previously mentioned our factor is constant times temperature rise. For our item 4 we assume that the ground temperature will be 30 degrees. 79.52 minus 30 equals 49.52 and this times .31 equals 15.35 and is our factor.

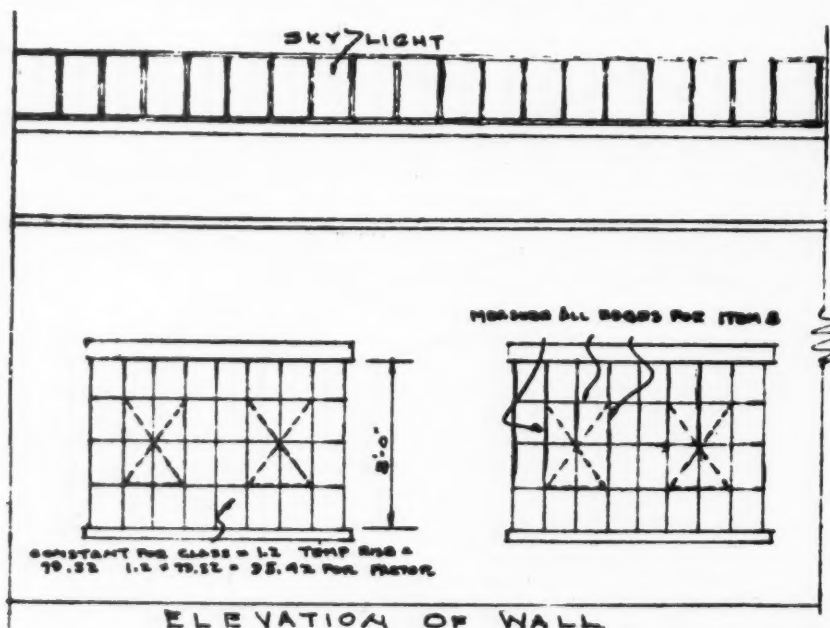
Now let us take up the ceiling in the same manner. One of the illustrations shows that the ceiling is $1\frac{1}{2}$ inch boards with built-up roof. The constant for a roof of this type is .35. Following out our rule from item 4 we multiply .35 by 79.52 which is 27.83. This is our factor for the ceiling.

Item 6 is the window constant and factor. Another of our illustra-

tions shows a typical window and established our constant as 1.2. Again applying our rule we have 1.2 times 79.52 and the answer is 95.42.

Item 7 is the wall constant and factor. Our wall is 13-inch brick without any plaster and the constant for this type of wall is .32. This .32 times our 79.52 equals 25.44 which is our factor.

Now we come to our glass and door edge for item 8. In this building the windows are composed of a large glass area cemented into the wall so that there is no infiltration but with movable sections in the center of each window. We must know the total linear feet of sash and doors edge where there is any chance of infiltration of outside air. We have 16 windows and two doors in the factory proper. The windows are 12 feet by 8 feet but the area of one movable sash is 3 feet by 4 feet or a perimeter of 14 feet. Since there are two movable sash in each window we have 28 times 16 (the number of windows) which equals 448 feet. The door at the far end is 10 feet by 10 feet or a perimeter of 50 feet of edge. This gives a total of 548 feet for the factory. The same procedure is followed for the windows of the other three rooms.



This elevation of the wall shows the type of window used. Only the inner section is movable and the outside of the whole window is tightly sealed into the wall. So we count heat loss only for the movable sections

Heating large buildings by fan blast systems requires entirely different principles from those used in gravity heating. Engineering, not guesswork, must be applied. Platte Overton, author of this article, is a practical engineer doing a consulting service. This article explains a simplified method of engineering. Let us know whether it is clear to you. If you like this article we will follow this one with several more covering all types of buildings.

—The Editor.

Item 9 is leakage in B. t. u. per foot and is given as 100. This is an average for various conditions.

Item 10 is exposed gross wall area, in other words the number of square feet of wall area counting in the doors and windows. This is the four sides which are 160 feet by the height of the eaves and 60 feet by the height of the eaves. This gives us 6224 square feet for the factory, 240 square feet for the men's toilet and 492 square feet for the office.

In item 11 we find the gross glass area not counting in the skylight in the roof. On the actual job from which this plan is drawn this is 1756 square feet for the factory, 96 feet for the men's toilet and 213 square feet for the office. The skylight is 40 square feet. Note that in all these items no provision is made for the women's toilet since this is an inside room and has no outside walls.

DATA SHEET

N 35 %
 NW 35 % NE 30 %
 W 30 % E 20 %
 SW 20 % SE 10 %
 S 5 %

Based on 0 °F. Cold Weather & Prevailing Winds From NORTH WESTBldg. FACTORY

Date _____

Loc. _____

H. & V. _____

Exposure Factors

Arch. _____

Engr. _____

Rooms No.	1	2	3	4	TOTALS
Use	FACTORY	MEN'S TOILET	WOMEN'S TOILET	OFFICE	
MEASUREMENTS					
1. Room Dimensions	16' x 58'	8 x 20	8 x 15	20 x 21	
2. Cubic Feet Space	13,360	1920	1440	5040	
3. Room Floor Area	8520	160	120	420	
4. Floor Const. & Factor	.31 - 15.35	.31 - 12.4		.11 - 4.4	
5. Ceiling Const. & Factor	.35 - 27.83				
6. Window Const. & Factor	1.2 - 95.42	1.2 - 84	1.2 - 84	1.2 - 84	
7. Wall Const. & Factor	.32 - 25.44	.32 - 22.4		.32 - 21	
8. Exposed Sash and Door Perimeter, equiv.	548	28		76	
9. Leakage B. T. U. per ft. of Perimeter	100	100		100	
10. Exposed Wall Gross Area	6224	240		492	
11. Exposed Window Gross Area	1756	96	405	213	
12. Exposed Wall Net Area	4468	144		279	
13. Exposure Direction	average 25%	SW		SW	
14. Room Temperature	70°	70°	70°	70°	
HEAT LOSSES					
15. Wall Loss B. T. U. per Hr.	113665	3225		5859	
16. Window Loss B. T. U. per Hr.	269152	8064	3360	17822	
17. Subtotal Loss B. T. U. per Hr.	383417	11289		23781	
18. Expos. Allow. B. T. U. per Hr.	95854	2257		4750	
19. Floor Loss B. T. U. per Hr.	46191	2480		1320	
20. Ceiling Loss B. T. U. per Hr.	237362				
21. Leakage Loss B. T. U. per Hr.	54800	2800		7600	
22. Total Heat Loss	817624	18826	3360	37421	877231
23. Deduct for Heater Size	27400	1400		3800	
24. Heater Building Loss Load	190224	17426	3360	33621	844631
SERVICE					
25. Air Supply C. F. M.	16700	Alternative 384		Alternative 770	
26. Recirculation C. F. M.	14863				
27. Air Supply Inlet Temp.	120°				
28. Air Supply B. T. U. Service	517624				
29. Direct Radn. B. T. U. Service					
30. Direct Radn. sq. ft.		73	14	140	227
31.					
32.					

ADDITIONAL HEATER LOADS

33.	
34.	
35.	
36.	
37. Outside Air Heat Loss, up to room temperature	
38. Return Air Heat Loss, up to room temperature	162000
39. Humidity Service	173172
40. Building loss load	190224
41. Total Heater Load	1,122,356
42. Chimney Size Required	11 x 17 - 24' HIGH

Here is our data sheet as we would fill it out for this job. When all the items are accounted for we KNOW that every possibility has been covered and that our system is sure to heat

Item 12 is self-explanatory.

Item 13 is an estimation which is frequently overlooked by the heating man, but which should always be taken into consideration. It may mean just the difference between a first class job and a job which fails to produce in cold weather. Or

more specifically windy, cold weather. One of the tables gives some established exposure percentages which are high enough to cover practically all conditions.

Our factory building is exposed on all four sides. But we must consider that the wind won't strike

the building on more than two sides at the same time. We use 25 per cent since that is just about one-half the exposure of the highest two sides of our building. This safety percentage is 25 per cent.

Item 14 is self-explanatory and is entered as a matter of record.

Now we get to the part of our data sheet on which our heat losses are entered. The first item, item 15, must be figured from some of the earlier items. Our wall is 13 inch. Our factor for this class of wall is 25.44. We established this in item 7. Just for review we can go back over these figures. The constant for a 13-inch brick is .32. This factor is the heat loss in B. t. u. per square foot of wall surface per degree difference in temperature per hour between inside and outside air. So we multiply the exposed net wall area, 4468 by 25.44 and get 113,665. We do the same for the other rooms.

Item 16 is item 11 plus 1071 square feet for skylight times the factor in item 6. This is also entered for all rooms.

Item 17 is self-explanatory.

Item 18 is item 17 times item 13.

Item 19 is area of all floors up to a distance of 10 feet out from all exterior walls times the factor in item 4.

Item 20 is similar to item 19, but is for the ceiling. Because of the type of building all the area of the roof is considered and we multiply this area by the factor from item 5.

Item 21 is 8 times item 9 and relates to heat loss through our glass areas.

Item 22 is self-explanatory.

Item 23 may require some explanation. We figured the heat losses in item 22 as though heat was being lost through all four walls simultaneously. We realize that at the worst condition heat loss will be through but two walls at one time as there will be a negative loss on two sides at least. So we take 50 per cent of item 21 which gives us 27,400 B. t. u. loss per hour.

Item 24 is item 22 minus item 23. This is the amount of B. t. u. our heater must be able to furnish to maintain 70 degrees inside.

Item 25 starts the section devoted to what equipment we must supply to heat this factory. We must know the c.f.m. required. We determine this by dividing the B. t. u. loss in

item 22 by 48.96. This constant 48.96 is an accepted rating and would require considerable engineering calculations to explain here. I will be glad to explain, however, if any reader wishes. 817,624 divided by 48.96 equals 16,700 c. f. m. and gives us item 25.

On item 26 we base the size and capacity of our fan. We know that just as soon as the warm air is introduced into the building it begins to cool. In a factory of this kind we usually introduce our warm air at a register temperature of 120 degrees. A safe margin to figure for cooling is to figure that our air temperature will drop 60 degrees before it reaches the heater again. So we use 60 degrees as the temperature of the air when it reaches the fan.

Now we wish to complete the calculations for the recirculation. We determine this recirculation by the following rule. One cubic foot of air at 120 degrees weighs .068 pounds. One cubic foot of air at 60 degrees weighs .0761 pounds. Then .068 divided by .0761 equals .89 approximately. 16,700 times .89 equals 14,863 c. f. m. or 100 per cent recirculation.

Item 27 is self explanatory.

Item 28 is another way of stating item 22.

Item 29 and item 30 have to do with another contractor's worries.

Item 39 brings up humidity. In this building we wish to maintain a relative humidity of 40 per cent. Air at 70 degrees temperature, maximum saturation, contains 7.98 grains of moisture per cubic foot. Then 40 per cent of 7.98 equals 3.193 grains per cubic foot. As we are recirculating 100 per cent and will assume that only 50 per cent of this moisture content is given up through leakage, condensation on fixtures and machinery, occupants, etc., we require 50 per cent of the 3.193 grains or 1.596 grains per cubic foot.

Now 15,030 c. f. m. (16,700 c. f. m. at 120 degrees cooled to 70 degrees) times 1.596 equals 24,087

grains of moisture. One pound of moisture contains 7000 grains. Then 24,087 divided by 7,000 equals 3.4 pounds of moisture per minute and times 60 equals 204 pounds of moisture per hour. As it requires 858.69 B. t. u. to evaporate one pound of moisture, 858.69 times 204 equals 175,172 B. t. u. extra required to maintain our desired humidity. This load must be added to our heater load. Perhaps this explains why so frequently either our desired humidity is cut or our heater isn't large enough to maintain both humidity and heat.

Items 40 and 41 are self explanatory.

From this total heater load we can determine the size of heater necessary. We must have a heater capable of delivering 1,127,396 B. t. u. (Item 41).

Of course we must have an adequate chimney. Or rather a large enough flue. If we don't our heater won't draw and we won't get heat. To determine the flue area we must know the required grate area. The formula for this is—14.863 times 60 times 0.24 times .068 times temperature rise (60 to 120 equals 60) divided by 7200 equals 121.2 pounds of coal per hour. 121.2 divided by 12 equals 10.1 square feet of grate area.

Then referring back to item 42 we have—.85 times (10.1 divided by the square root of 24) equals 1.75 square feet of flue or a flue 17 inches by 17 inches conforming to standard brick measure.

This completes our data sheet. If we have made all our calculations correctly we know that we have taken into account EVERY item we should. This being so, we know that our heating system is adequate for the demands and will heat the building.

If this is not all clear write me and I will explain any detail you may be hazy on. A subsequent article will explain how we take these figures and use them to design the rest of the system.

Some Figures on the Cost of Handling Salesmen's Cars

IN these days when the use of an automobile is almost universal in business, just what it costs to operate a car is always one of the problems confronting managers. Quite a lot of calculations have been made and the investigations conducted have been too numerous to mention.

Most of these investigations have, however, been in fields where the conditions are somewhat different than in our own. So it is with interest that we read about the investigations conducted under the auspices of the Metal Branch of the National Hardware Association, now known as the National Association of Sheet Metal Distributors.

The results of this investigation were given at the 1930 meeting held in Niagara, Canada. In the same investigation an inquiry was made into the different methods of owning cars and methods of buying vehicles. The report is as follows:

From the attached composite report it will be noted that members employ various methods in the handling of salesmen's automobiles. The most popular plan seems to be that of salesmen's ownership paying own expenses. A member states:

"We have tried all plans. Our experience was so unsatisfactory that we have placed all our men on a profit sharing basis, and they each own their cars and pay their own expenses. Traveling by automobiles forced us to do so and we have used the present plan for three years and we would not even consider any other. We cannot be sufficiently emphatic regarding this policy."

Ownership Expense Arrangement

Salesmen own cars, pay own expenses44%
Salesmen own cars, house pays

expenses37%
House owns cars and pays expenses19%

It will be noted that where salesmen own cars and the house pays the expenses that a flat allowance is made to the salesmen for the operation of the car.

A flat expense allowance has its advantages as it eliminates the auditing of expense accounts and any argument concerning expense items.

Comments of members and the various plans used indicate that compensation and expenses are closely related because the net value of a salesman is based on his profits less his salary and expenses.

Some houses allow salesmen a certain amount monthly to cover depreciation, if not included in his expenses, of approximately 25 per cent per year of the value of the car. It is suggested that in some instances it is advisable for sales-

men to leave the amount allowed for depreciation with the house at 6 per cent interest in order that they may have money to buy a new car when necessary.

Assisting Salesmen in Buying Cars

No52%
Yes22%
Assist to some extent.....26%

When the house finances the purchase of cars it seems preferable to loan the salesmen a certain amount rather than to retain ownership, the house retaining the allowance for depreciation together with any additional amount the salesmen can pay monthly on the purchase price.

Plans Used for Assisting Salesmen in Buying Cars

No. 1 and No. 2 plan as shown on the chart, each.....13%

No. 3, by loan repaid from salary or expense account,
(Continued on page 47)

COMPOSITE REPORT—METHOD OF HANDLING SALESMEN'S AUTOMOBILES

Districts.....	East	South	Central	West	Totals & Avgs.
Number of houses reporting.....	30	42	50	11	133
Ownership—Expense Arrangement:					
Car owned by salesman—					
Paying own expenses.....	19	30	17	5	71
House pays expenses on mileage basis.....	2	3	1	1	7
Flat allowance.....	6	11	25	5	47
Actual expense.....	4	1	2	..	7
House owns car—pays expenses.....	6	9	14	1	30
House using more than one of above plans....	5	10	5	1	21
Assisting salesmen in buying cars:					
Yes.....	4	7	8	3	22
No.....	10	14	21	6	51
Occasionally.....	6	9	9	1	25
Plans used for assistance:					
1. Note—Deduct from bonus.....	3	..	2	..	5
2. Chattel mortgage on car.....	1	1	3	..	5
3. Loan—Repaid from salary or expense account.....	2	10	4	4	20
4. Advance part of cost—repaid as above....	1	..	2	..	3
5. Mileage basis.....	1
6. Assistance on down payment.....	..	2	1	..	3
Method of Paying Expenses:					
Separate allowance.....	10	15	27	3	55
Combination salary and expense.....	10	16	13	5	44
Operating cost (depreciation and insurance omitted):					
Per month—Average.....	57	62	64	60	62
Per mile—Average.....	.058	.045	..	.05	.053
Total expense of salesmen working in home city (exclusive of salary), average.....	65	49	51	77	57

An Aluminum and Copper Marquise Without Bolts Or Seams On the Under Side

THE country is seemingly witnessing a return to favor of metal for architectural adornment. This is particularly true in our larger cities, where some of the country's largest and most interesting buildings have been covered and trimmed in metal and where more of the same work is either in progress or being considered. This use of metal is also being extended to the smaller useful adornments, such as the marquise.

For example, the Bloomingdale department store in New York City

The marquise has three decks. Each deck face has an aluminum panel. The decks are of continuous copper sheeting

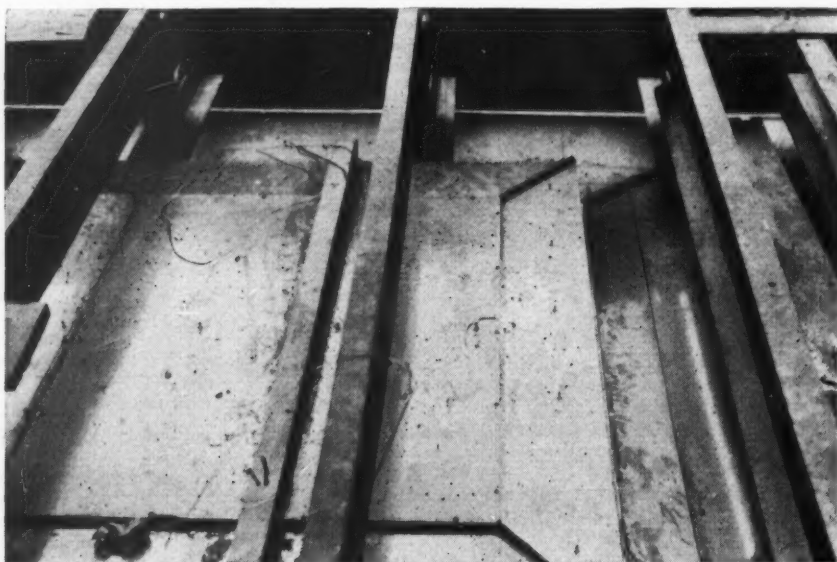
on its new addition uses two marquise, one over each street entrance. It is interesting to note that the construction of this large addition is the Bloomingdale contribution to employment in times of slack construction. Erection of the building has kept many men busy all this past summer.



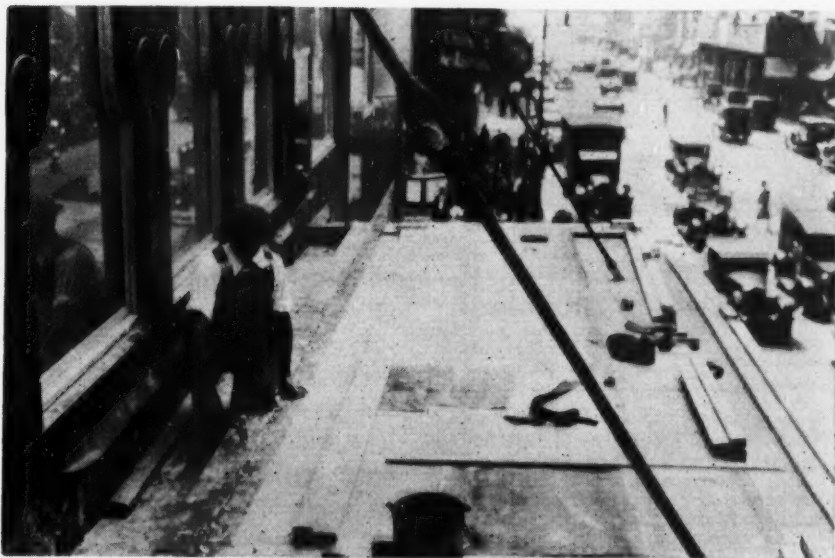
These marquise are of aluminum, with a very interesting under face which is indirectly lighted by bulbs concealed in a special trough. The top consists of three decks, set back on one another, and topped with a copper deck. The front of the marquise is constructed with a special open panel which is to hold the glass name of the company lighted from behind.

The design and construction of this marquise was worked out and erected by Herrmann and Grace, sheet metal contractors of Brooklyn. This firm has some interesting work to its credit, especially on jobs requiring skill in design and intricate construction.

The most interesting features of the marquise are the architect's declaration that he would not accept the work if a single scratch showed on any part of the three faces or the under side and that the marquise is to have a satin finish to be given by rubbing. Some further details of this part of the work will be related later.



All the necessary seams are turned up and riveted. On the under side these seams are rubbed smooth. The entire face was assembled and erected as one unit



The copper deck is continuous through the gutter, over the top and down behind the aluminum faces. All the copper seams are flat locked and soldered

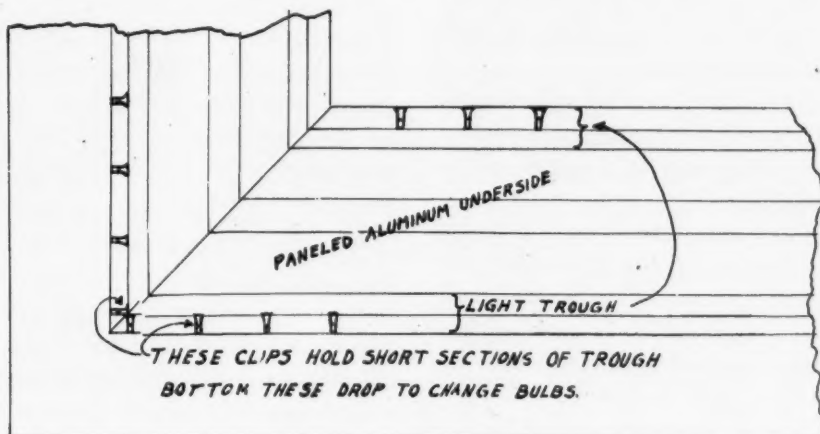
The construction of the marquee follows standard practice in the general design and construction, but differs considerably in many of the details.

The framework is composed of structural iron channels jutting out over the sidewalk and supported at the outer edge by a heavy iron rod. The outer edge is higher than the back edge.

In order to have an under side without any bolts or rivets showing it was necessary to design the sheets so that every seam turned up into the inside of the marquee. The sheets were long enough so that a mitre was made at each corner and the turned up seam riveted inside the marquee. The three vertical faces of the decks are formed out of aluminum. The pattern is a

series of vertical mullions, two narrow mullions between a pair of heavy pillars. The sheet and the vertical pieces are cut off square at the bottom, but the top is a formed paneled cornice.

The under face was built and erected first. The unusual part of this job is the fact that the entire under face was formed up and finally assembled in the Herrmann and Grace shop and carried to the job and erected as a single unit. This was no small job since the under side measures approximately 11 feet by 26 feet in area and built as it is of aluminum is not too stiff. In addition the finish had to be carefully protected from scratching both during hauling and erection. This part of the job, however, was done without a hitch.



These small clips, held by screws, hold short sections under the light trough. Access to the bulbs is through these panels

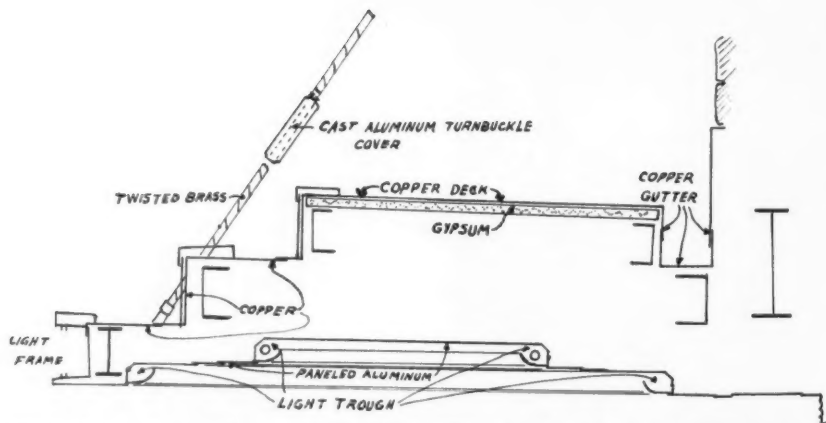
This under side is a series of depressed panels, each section working in from the outer light trough being just a trifle depressed. The light trough, as can be seen in the drawing, has a curved channel for reflection and at the base of the curved section a flat panel which lies below the light bulbs. This flat section is built in short sections and the sections are held in place by ornamental clips which are in turn held in position by a flat, depressed screw working into a stiffener angle behind the aluminum panel. The screws which show here and in the secondary light trough are the only bolts, rivets or screws which show from the under face. These had to be used, however so that worn out bulbs can be replaced.



This cast aluminum ornament is fastened to the deck face with embedded bolts on the back

The drawings and the pictures show in a general way the construction of this under face. One of the pictures shows the turned up seams. On the under side this seam appears as a butt joint which when smoothed out and rubbed presents an unbroken surface to the eye. This seam, with the exception of the mitre corners, is placed at the vertical edge of the depressed panel and so does not show. All the standing seams were riveted.

The risers of the three decks are



This shows the continuous copper sheet. The aluminum faces are not fastened through the copper. The under side is paneled and given a rubbed, satin finish

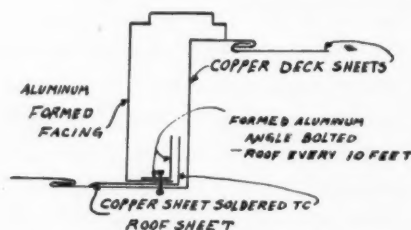
ornamental formed aluminum. This ornamentation consists of a series of nearly square projecting panels spaced at approximately 3-foot intervals. Between these panels there are two mullions scabbard design. These are fastened invisibly to the backing sheet.

This riser ornamentation is solely for adornment, the water protection is provided by a base sheet of copper. The riser ornamentation is formed as shown on the drawings and consists of a cornice of square proportions on top and the described panels on the face. The ornamentation ends abruptly at the bottom with a comparatively wide turn under.

The method of attaching this ornamentation is ingenious. One of the drawings shows a detail of this part of the design. The under deck sheet of copper runs continuously under the ornamentation. To this deck sheet, about two inches out from the 90 degree turn at the step, a narrow sheet of copper was soldered to the deck sheet. This sheet and the soldered seam is continuous clear around each riser. This sheet extends up behind the ornamentation. On top of this narrow sheet a formed aluminum angle was bolted with bolts at about 10-inch intervals. The riser ornamentation was put in place and the bottom turn-under forced under the aluminum angle. This held the bottom in place without any bolts, rivets or soldering. The whole affair was stiff enough, because of its formation, to stand without help. No provision is

made to fasten the top to the deck. However, the entire three sides were welded into one continuous piece and the ends against the building frame were fastened to the building frame.

The construction of the copper roofing sheet is such that on this sheet alone depends the waterproofness of the marquise. The back side of this sheet forms a deep gutter with the usual flashing seams on the



This is the ingenious method of fastening the deck faces. No bolt passes through the copper sheet

building side. This deck sheet is carried full across the top of the marquise with soldered seams and down under the ornamentation on each of the two riser steps. This seals the inside from moisture. This sheet is also carried behind the light panel of the front.

The gutter is sealed at both ends, but is connected to a gutter on the next lower deck by a concealed pipe outlet.

One of the interesting features of the marquise is the supporting rods. These are encased in twisted brass and the turnbuckle is enclosed in a cast aluminum unit into which the twisted brass is sleeved.

The erection necessitated considerable care, but the most delicate part of the job was the finishing.

The architect specified a satin finish to be secured by rubbing. Several possible materials for this rubbing were tried, but the combination selected was a very fine steel wool soaked in banana oil. Crankcase oil, lubricating oil, and other greasy substances were tried, but the banana oil proved best. The steel wool served to remove the gloss, while the oil prevented the wool from being so scratchy as to injure the finish. The result is most pleasing. The window frames on the store front are also aluminum, and these were given the satin finish before the marquise was erected. Although subjected to much dust, dirt and fumes from the street, these frames show just the satiny finish desired after several weeks of exposure.

On the two marquise some 120 sheets of 16 gauge aluminum were used. Two widths were used—5-foot and 10-foot.

OVERHEAD

(Continued from page 27)

fluctuate as shown and it were added to any other cost item as a basis to find the percentage, the same fluctuation would result, and it would not represent a true figure.

Just because 100-, 90-, 80-per cent are high figures, when added to productive labor, does not mean that the result in dollars and cents is high. Oftentimes it really represents a lower percentage than if taken on some other item or items, and it has been found more nearly correct and fair.

Luckily, too, this figuring on productive labor is simpler by far than any other method that has been suggested, and fractions, the bug-a-boos of the sheet metal business man, is overcome. This can be illustrated by a typical bill:

Material	21.60	
Labor	13.17	
Overhead	13.17	
	<hr/>	Overhead 100%
	47.94	
Profit (1/4)	11.99	20% asked—add
	<hr/>	25 or 1/4
	59.93	

and it is correct by years of comparison.

All in a Day's Work

..... N. Dak., Sept. 9th, 1930.

Gentlemen:—

Inasmuch as I have all day Sunday to spend here in, a thriving city of 300 people out on the edge of the Bad Lands, I shall take a few minutes' time to explain to you how hot some of these inquiries are that sometimes come through the mail.

In the neighboring town of there is a firm by the name of the Lumber Co. who have been inquiring for catalogues and prices about every thirty days for the past three months. I gradually became enthused over this prospective dealer and finally decided to drive over from which is about sixty miles distant. I ferried across the Missouri river at Washburn and inquired about the roads before proceeding any further and was told that I couldn't help but miss the road and this was correct,—I missed the road all right.

At any rate I arrived in just in time to get the last room in the hotel next to the parlor, a cute little room about 6 x 8 with a cute little bed in it about two-thirds as wide as my back, having a very thin mattress. I slept quite well, but owing to my excessive weight, I looked something like a waffle the next morning.

After getting my mail out, writing to several dealers who had sent in inquiries and thanking them for their inquiries and assuring them I would call as soon as convenient, I smiled at the idea of having such a hot prospect to work on this very morning, with rapid step I "hot footed" over to the office of the Lumber Company and began preaching the gospel of the double feed door and seamless construction when I walked Mr. Zuern (that name is correct, no joke), who was

Reams have been written about the trials and tribulations of the furnace dealer. Let's pause here and give a thought to the troubles of the manufacturer's salesman. His travels are not a bed of roses. No sooner does he get a "hot" tip than everything conspires to spoil his triumph. Here's one salesman's troubles.

considered a very good furnace prospect by the manager of the Lumber Company.

I talked furnace to this man, and how, I gave him the works, both barrels at once, after which he stated that he liked the welded construction of the furnace, in fact was quite well pleased with the features of the furnace and told me I might come out and look his house over for the installation of the furnace. I was so anxious to close this sale that I drove out ahead of the owner and after opening several gates I arrived at the house of Mr. Zuern.

As usual, I started out by making a drawing of his house, being extremely careful in figuring all the windows, doors inside and out and what not, after which I began figuring out the installation according to the Standard Code, considering that I should take the warm air pipes off the back of the furnace, have them well equalized and uniform in length, proper pitch, heat loss in ceiling, wall, floor, basement, northeast and northwest exposure be carefully considered, whether the trees in the yard would help any

and if the occupants of the family would wear red woolen underwear or some other kind.

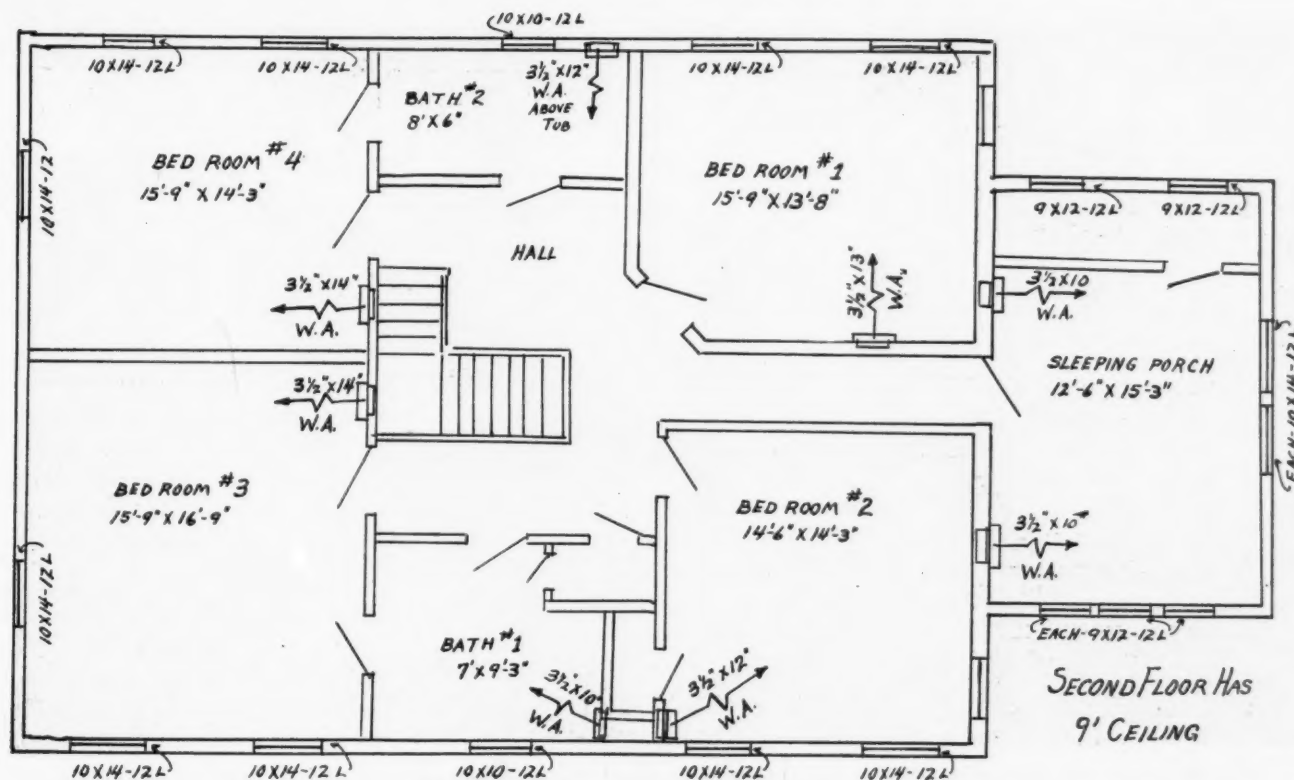
I carefully checked and double-checked my plans and being convinced that I had the job figured 100 per cent according to the Standard Code, with a great deal of pride and satisfaction I presented the plans to Mr. Zuern for his inspection. After I explained to Mr. Zuern that it was really necessary to have cold air returns to a furnace, he objected quite seriously to the pipe provided for carrying the cold air from the cold air channel boxes to the cold air shoes on the furnace. I finally figured a pit system which appealed much more to him, however, that did not eliminate all objections.

Mrs. Zuern, who should be considered, at this point began to carefully scrutinize the plans and she decided that the cold air faces were too close to the doors, for sweeping with a large broom would have a tendency to drop a few particles of dust in the cold air channels. It was then Mr. Zuern's turn at bat and after I had agreed to making a few alterations to the location of the cold air faces, Mr. Zuern bitterly objected to the change as this would be the very spot he had planned some electric wires and he thought there might be danger of someone being electrocuted sooner or later.

At this point I began to lose patience and I asked Mr. Zuern what he expected me to do with these cold air faces, hang them out on the clothes line, which would be about as beneficial as having them installed as he had suggested. Mr. Zuern's temper became aroused and so did mine and we had words; realizing that cross words would not help the situation we both came half way and made up again.

Mr. Zuern then made the statement that he would take a furnace

(Continued on page 56)



Bedrooms number 1 and 2 and the sleeping porch do not heat up in the morning. Later in the day, if the heat is kept on, and the doors of these three rooms are left open, they get hotter than any other part of the house. If the doors are left closed they do not heat. The owner wants this remedied and is willing to make whatever changes the majority of our readers agree on

floor grilles. On the first floor most of the registers are in the floor, while on the second floor the registers are in the baseboard. The furnace is located under the kitchen-living room partition.

For the benefit of you fellows who want to go about this problem in a really scientific way, the following information is given: The outside walls are composed of wide wood siding, 1 inch thick, paper, sheathing, 2 by 4 studs, paper, plaster base and plaster. Wood lath are used and there is no insulation between studs. This gives us a coefficient of 0.262 B.t.u. per hour per square foot of wall area per 1 degree temperature difference with a 15-mile wind.

The windows are wood frames with wood mullions and small panes of glass, puttied in. The size of the individual panes for the different windows together with the number of panes in each window is given on the drawings. For example, the two north windows in the end of the living room are listed as 11 by

15—12 lights. This means that each glass pane is 11 by 15 inches and that there are 12 lights in the window. This would give us a sash area of 33 inches by 64 inches. The outside frame dimensions would then be 45 by 72 inches.

The roof is composed of 2 by 5 inch rafters with sheathing, paper, and wood shingles.

For cubics the house is 43 feet wide by 32 feet. The attic space is not heated and is not insulated. The second floor ceiling is plaster on wood lath on 2 by 6 joists with a rough wood floor without finished flooring.

Purposely there is no layout shown for the basement duct system. No sizes for these basement ducts are given, either. Here is the reason why:

The contractor who put in the job wants to fix the job up so that there will not be any dissatisfaction on the part of the owner. The owner is satisfied with the heating system with the exception of the "bugs" we

have explained. The owner does not want his present system all torn up, but he has agreed that if there is a majority opinion shown through the medium of this trade paper he will abide by our industry's experience and alter the system to conform with our ideas.

This seems an excellent chance to show what readers of *AMERICAN ARTISAN* can do in the way of solving a troublesome problem. If we can have a good agreement from the readers on this trouble we will assist one of our friends out of a difficult situation and at the same time give the old trouble-shooting sense a little exercise. For our part, we will submit the problem to some of the best known heating men in the industry and see what they say about it.

Everything explained? All right, let's have the sketches and layouts and the advice on how this system should be laid out. You can indicate your duct or pipe system right on the drawing shown, if you like. Be sure to give sizes.



This shows a body production line in a large automobile plant. The experimental department of this plant employs nearly 400 sheet metal men and mechanics for the sole purpose of developing new bodies

The Sheet Metal Worker In Today's Automobile Plant

SHEET Metal Work plays a dominant role in the manufacture of bodies for motor cars of every description, as also in the building of airships and airplanes. The latter, particularly the airships, being built in singles, or in too small numbers to warrant the introduction of standard parts by quantity production, are constructed almost entirely by work of hand.

This applies in a degree to the building of many commercial vehicles, especially large buses, made to order delivery trucks, motorized street cars and such other motor coaches and vehicles as are being introduced by railroads, public works departments and large stores. Many of these vehicles are built in singles

By **ERNEST E. ZIDECK***

at first, being tried out in the particular service for which they are built, and the subsequent orders for more of the particular type never are large enough to warrant the expenditure for special dies and machinery, as justified in the making of automobiles.

But even in the manufacture of standard makes of cars, which are being turned out by the thousand in a single day, and the manufacture proper of which is done entirely by machinery and machine-like operations of the human hand, the sheet metal expert and craftsman finds meritorious employment.

This is in the experimental or sample body building activities which each year at each of the nu-

merous auto plants precede the actual making of the new models of cars.

So, for instance, the experimental department of the Buick factories at Flint, Mich., employs upwards of four hundred highly specialized men, sheet metal workers, hammermen, smiths, welders, jig and fixture makers, experimental diemakers and such, for the sole task of building three distinct sample bodies, one of which is to represent the new model for the export trade. And, it is surprising what a great amount of parts, steel bar, plate and sheet metal, are required in a single auto body. Even when the change in the model is slight, it generally upsets every part, and each of the hundreds of single items composing the body must be re-

*Formerly Instructor, Federal Board for Vocational Education, New York City.

designed and made new.

This work is done in the old fashioned manner of shears and mallet and hammer and such hand machines and tools as may be found in the smallest of up-to-date sheet metal shops. Of course, there are power brakes and power hammers and power shears and all the power imaginary, in addition to all kinds of presses, metal saws, arc, torch and spot welders. But few if any of the above are actually used, except, perhaps, the power shear in the cutting up of sheets; the brake, in the forming of large parts; the hammer, in the shaping of panels which must be finished by hand. The gas torch or the spot welder are used sparingly, because the parts must be made so as to represent the original of what later the die will shape.

It is not the making of the parts as much as making them in a certain manner which counts most. The work is primarily experimental and is done with the end in view of determining how a certain piece of sheet metal must be worked to represent the part wanted, its required strength, shape, fit, facility of handling in assembly, and, last but not least, its appearance upon the finished car.

That is why in ninety cases out of a hundred the blue prints made with the original design are changed as the work of making the parts proceeds. Many times a single part must be redesigned and remade a dozen times. Frequently the material, gauge, finish of the metal, the number of operations required to make it by machinery, and many other items, undergo alterations as the parts are being built.

From the foregoing it may be seen that it is not the building of a sample body by hand so much as it is the determining of how each of the hundreds of parts may best be made, best to withstand the strain, best to fit, best to assemble, best to appear on the car, and—it stands to reason—best, for the least



This shows the production line of a motor bus company. Many of these bodies are hand built as special designs and tried out. If the body proves popular the necessary dies and machinery are installed and the body is put into production

money, which keeps the engineering staff and the quite large force of experimental workers busy year in, year out.

Several months of overtime work is required to build a new model of a passenger car. The body is divided into its component parts. Each single part has been made and tried out. It is known to the minutest detail what materials to use in each, the mode and number of operations in each, the modes

and number of assembly operations, and so forth.

Each single detail is written down, recorded, gone over several times, inspected as to possible errors, etc., and then only when found correct and the whole co-ordinated for systematized production, dies are ordered and machines installed, the plant equipped and organized. Dies arrive in due time, materials are ready, machines manned, and actual production begins.

CAR COST

(Continued from page 39)

as 54% of reporting members use that method.

No. 4.....	9%
No. 5.....	2%
No. 6.....	9%

Method of Paying Expenses

Separate allowance for expenses	56%
Combined salary, expenses.....	44%

Operating Cost

Average cost per month for operating a car.....	\$62.00
Those houses reporting the cost higher than the general average	52%
Those reporting the cost lower than the general average	48%

Operating expense. It will be noted that there is some variation

in the cost as reported of operating automobiles. As you know this is possibly because of the different manner in which cars are operated. If, for instance, a man covers a small territory being at home every night, possibly having his own garage, repairs being made by a mechanic who takes care of all cars for the house and in other instances cars may not be operated full time.

Expense of salesmen working in home city. Exclusive of salary the general average of \$57.00 is conservative and is no doubt quite fair.

There is quite a wide variation in the expense of salesmen working in the city in which the house is located. This also varies in accordance with conditions, the size of the city, traffic congestion, the amount of territory covered, whether a garage is owned, etc.

THIS WEEK'S LETTERS



AIR CONDITIONING

The subject of air conditioning is now past the stage when it was discussed only among the men in the warm air heating industry. As a matter of fact air conditioning is today being talked about and information on it sought by people building new homes or remodeling old ones.

It cannot be denied that this subject has required a tremendous amount of energy to get it across to the American public and almost as much energy to drive it home to the heating industry.

We print here a letter on air conditioning which came in this week's mail. It's well worth reading and may, perhaps, set some facts straight in your mind and give you new talking points.

AMERICAN ARTISAN,
139 North Clark Street
Chicago, Ill.

Gentlemen: AMERICAN ARTISAN has had much to say about the important subject of Air Conditioning. This subject, as you well know, touches right home with me. I can't resist setting down some thoughts on this subject which have been running through my mind for years.

The rapidly gaining popularity of air-conditioning systems simply indicates that a revolutionary development is taking place in the warm air furnace industry. Those manufacturers and dealers who were first to admit that forced air was the one thing necessary to remove any element of doubt as to the positive air delivery of a furnace installation; and also recognize that it was the most important factor in broadening their market, are the ones who are today reaping greater profits and building a bigger and better background for their future.

It is predicted by many leading authorities in the heating field that

the air conditioning system is destined to be the popular system of tomorrow, because of its many appealing features found in no other system.

An unbiased analysis of just what this system furnishes very definitely shows the sound basis on which this prediction is made. We will briefly set down some of the features found in the air-conditioning system that will assure its general popularity:

I. Quick and positive heat in every room.

II. Several changes of air per hour.

III. Clean, filtered air — winter and summer.

IV. Registers may be placed in any desired location, allowing full room dimensions for the most desirable placing of furniture and for other practical uses.

V. No possibility of damage from frozen pipes or leaky valves.

VI. The air passes into the rooms noiselessly; it can't do otherwise.

VII. As the air is constantly in motion from floor to ceiling, there is approximately an even temperature, making the knee-high temperature where the children live quite as healthful and comfortable as where the grown-ups live. This exclusive advantage has a particularly strong appeal.

VIII. The pure, filtered air, being constantly in motion, cannot become stagnant.

IX. Practically all of the heat generated in the furnace is forced into the rooms where it is needed; effecting thereby a substantial saving in cost of fuel, besides insuring a cool basement.

X. Use of system in summertime, for ventilating; making an all-year service available.

When all of these advantages are considered, it is quite easy to understand why those selling air-conditioning systems are taking business away from their radiator competi-

tion, and at prices before unheard of in the furnace business. They have only to put their many advantages on the scale with those of their competitor in order to show the prospective buyer conclusively which system he should buy.

The idea inherent to the Britisher that he won't consider adopting anything new because his father and grandfather got along without it, has to a more or less degree been evidenced also by many in the furnace industry. The arguments in favor of positive pressure fan systems with filtered air, were just as sound six years ago as they are today; but it has been necessary that various influences can be exerted upon the industry in order to get their attention.

Whether some of the industry believe it or not, its progress is swift and sure, and as one furnace manufacturer so fittingly expresses it, "the science of furnace heating comes with fan in hand to separate the chaff from the wheat."

When such concerns as Holland Furnace Company, Carrier-Lyle Corporation, and others, feature air-conditioning systems in their national advertising, and in a comparatively short time establish unprecedented sales records, even the non-believers must admit that some element is out of step, and what that element is, must be quite apparent to them.

The leaders will continue to lead, and the non-believers will continue to doubt until it is too late for them to do anything about it; they will waken to find that they have nothing to sell in competition with what the public are generally demanding. Air conditioning systems are here to stay and with their great appeal, are destined to become the popular choice of the building public.

Very truly yours,

(Signed) Julius F. Janes

President

Warm Air Furnace Fan Company.

RANDOM NOTES AND SKETCHES

I know a lot of you folks look to this Random page as a pretty good place to pick up the latest joke floating around the heating and sheet metal industries.

As a matter of fact, this page is not solely one for humor, but rather one for a little knee to knee talk about what all you fellows are doing.

So with this explanation I'm going to say that this week there won't be a joke on this page. I'm sorry to say that instead I am going to say just a word or two about death which has visited some of our dearest and best friends since the last ARTISAN came off the press.

It's not easy to say just the right thing at a time like this. Most of us don't know what we can say to relieve the suffering or to make others like ourselves understand that we, too, feel deeply.

* * *

Thursday night, October 2, Mrs. A. W. Howe, wife of "Tony" Howe, President of the J. M. and L. A. Osborn Company, passed away. She was buried from her home, 2976 Manchester Road, Cleveland, Monday, October 6.

There probably isn't an old timer in the sheet metal industry who didn't know Mrs. Howe intimately. To one and all she was known as "Dora" and many conventions just couldn't start until she arrived.

For many years she accompanied "Tony" to all the conventions and many a younger woman, attending for the first time and feeling unfamiliar in all the hustle and bustle, secured that needed measure of confidence and companionship from "Dora" Howe. It was often said that "Dora" Howe held the record

for convention attendance for women.

During the last few years she did not enjoy very good health, but in spite of that handicap she went to the conventions, both state and national, and accompanied her husband on many of his business trips.

She will be missed—not only by the many, many women friends among the auxiliaries, but by the men of both industries as well.

* * *

And right in Cleveland and almost the same time comes word of the death of O. L. Moon, one of the real old timers of the warm air heating business.

Mr. Moon was president of the Scheible-Moncrief Heater Company of Cleveland. In the early days of furnace manufacturing this company and Mr. Moon were prime movers for better heating installations and better and more improvements for furnaces.

Mr. Moon was always proud of the fact that he was a self-made man. After leaving common school in Decatur, Indiana, he joined his father in the contracting business. Later he opened his own hardware store. Still later he associated himself with a stove and heater manufacturing company as a salesman and remained in the heating business until his death.

His direct contact with the industry during the years he was on the road and with the Scheible-Moncrief Heater Company made him the friend of hundreds of heating men in the middle west. He was always known as a man who had the best interests of the industry at heart and who could be counted upon to lend support to

any movement for the betterment of the industry.

In the last few years Mr. Moon was not seen so frequently at the conventions and meetings of dealers. Poor health and advancing years prevented active attendance. This was remarked at the various meetings since Mr. Moon had always taken an active and interested part in all discussions and committee affairs.

Mr. Moon was buried Thursday, October 2.

* * *

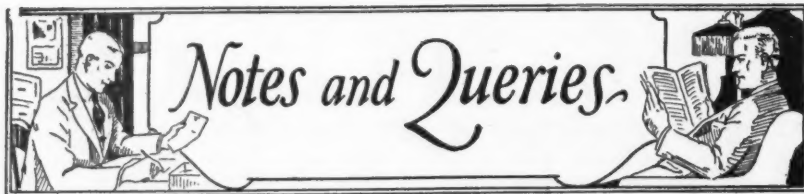
From Louisville, Kentucky, J. E. Merrick writes that Ferd Schupp, President of the Sheet Metal Supplies Company, died at his home, Monday, October 6.

Ferd Schupp was a native of Louisville and for thirty-five years was actively engaged in the sheet metal business in his home city. Not until just about one year ago did ill health keep him away from the office and active participation in the affairs of the company he helped organize nine years ago and has headed ever since.

Mr. Schupp is survived by his widow, Mrs. Sophia Schupp, a daughter and one son. Burial was Wednesday, October 1.

* * *

With these three death notices I am going to bring this page to a close. I know that you readers are not going to miss a few jokes and that to many of the older men in our allied industries this small tribute which the ARTISAN can pay to those who guided and worked in years gone by will recall other years and past accomplishments.



Circassian Walnut on Metal

From W. J. Tritz Hardware Company, Burlington, Iowa.

Can you refer us to a firm who lithographs circassian walnut on metal?

Ans.—O' Cedar Corporation, Lithographing Department, 4501 South Western Avenue, Chicago.

Skylight Lifting Device

From Linton Sheet Metal Works, Linton, Indiana.

Who makes chain skylight lifting devices for gable skylights?

Ans.—Danzer Metal Works, Hagerstown, Maryland; David Levow, 308 West 20th Street, New York City; Park City Cornice Works, Inc., 46-52 McKinley Avenue, Bridgeport, Connecticut, and Payson Manufacturing Company, 2916 West Jackson Boulevard, Chicago.

Oil Burner for Cook Stove

From Waldburger Brothers, Merrill, Wisconsin.

Please tell us what firms make an oil burner for cook stoves.

Ans.—Automatic Burner Corporation, 312 North May Street, Chicago; Gloria Light Company, 112 North May Street, Chicago; Home Oil Burner Company, Oronoque, Stratford, Connecticut; International Oil Heater Company, St. Louis, Missouri; The Jado Nickel Plating Company, 14 East Nilsson Street, Brockton, Massachusetts; E. L. Miller Manufacturing Company, 22 West 3rd Street, Kansas City, Missouri; Northwest Products Company, 923 West Lake Street, Minneapolis, Minnesota; Silent Glow Oil Burner Company, Hartford, Connecticut.

Pipe Connections

From Marshalltown Sheet Metal Works, Marshalltown, Iowa.

Can you inform us where we can get a supply of pipe connections with a square or hexagonal head $\frac{3}{4} \times \frac{1}{2}$ inch?

Ans.—Refer to Crane Company, 836 South Michigan Avenue, Chicago.

Address of Clarage Fan Company

From Robinson Furnace Company, Chicago.

Can you give us the address of the Clarage Fan Company?

Ans.—Kalamazoo, Michigan.

"Wheeler" Beading and Crimping Machine

From Harry T. Klugel, North Emporia, Virginia.

Who makes the "Wheeler" beading and crimping machine for crimping the ends of stovepipe?

Ans.—This was made by the W. A. Wheeler Manufacturing Company of Indianapolis, now out of business. However, similar machines are made by the Peck, Stow & Wilcox Company, Southington, Connecticut, and the Niagara Machine and Tool Works, Buffalo, New York.

Vacuum Furnace Cleaners

From Reliable Heating and Manufacturing Company, Memphis, Tennessee.

We should like to know who manufactures vacuum furnace cleaning machines.

Ans.—Brillion Furnace Company, Brillion, Wisconsin; National Super Service Company, Toledo Factories Building, Toledo, Ohio; the Kent Company, Inc., Rome, New York; B. F. Sturtevant Company, Hyde Park, Boston, Massachusetts, and Williamson Heater Company, Cincinnati, Ohio.

Stokers: "Brownell"; "Iron Fireman"; Other Makes

From C. H. Carpenter, Highmore, South Dakota.

Can you tell me who makes the "Brownell" stoker? The "Iron Fireman"? Also other stokers for warm air heating systems?

Ans.—The "Brownell" is made

by Brownell Company, Dayton, Ohio; the "Iron Fireman" by Iron Fireman Manufacturing Company, 986 17th Avenue, Portland, Oregon. Other stokers are made by Armstrong Manufacturing Company, Springfield, Ohio; Combustioneer, Inc., Goshen, Indiana; Domestic Stoker Company, 7 Dey Street, New York City; Ever-Ready Coal Burner Company, 209 East Baltimore Avenue, Detroit, Michigan; Fire-King Stoker Company, 1160 Roosevelt Road, Indianapolis, Indiana; Germer Stove Company, Erie, Pennsylvania; Paragon Kol Master Corporation, Oregon, Illinois; Phantom Stoker Company, 1231 Hanna Building, Cleveland, Ohio; Thomas Stoker Company, 5908 Park Avenue, Cleveland, Ohio, and the Uniflow Corporation, Sidney, Ohio.

Gasoline Gas Lighting Equipment

From F. W. Saxe, Dexter, Missouri.

Will you kindly let me know who makes equipment for lighting with gasoline gas?

Ans.—American Heating and Lighting Company, Morenci, Michigan; C. M. Kemp Manufacturing Company, 407 East Oliver Street, Baltimore, Maryland; Matthews Gas Machine Company, 6 East Lake Street, Chicago, Illinois, and Tirrill Gas Machine Corporation, 50 Church Street, New York City.

Automatic Humidifier

From Ralph W. Poe, 44 White Court, Canton, Illinois.

Please tell me who makes the automatic humidifier which consists of a cast iron pan with three water levels, fed by a manually operated drip valve.

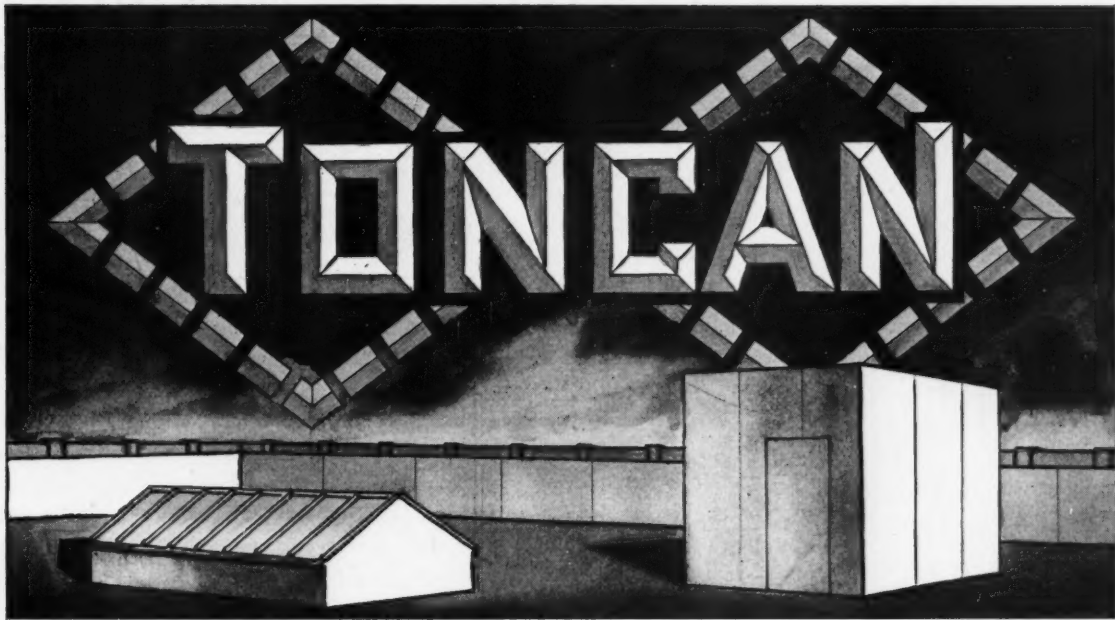
Ans.—Automatic Humidifier Company, Cedar Falls, Iowa.

Address of Northwestern Stove Repair Company

From C. O. Anderson, Ironwood, Michigan.

Can you give me the name and address of the stove casting repair firm located on Roosevelt Road?

Ans.—This is the Northwestern Stove Repair Company, 654 West Roosevelt Road, Chicago.



THIS IS NO TIME TO SKIMP


Today, as never before, people are looking twice at the money they invest in sheet metal for new buildings and for replacements on old buildings. With labor representing the larger part of every job, any material giving longer life, even at a slightly higher price, represents a worth while saving.

Such a material is Toncan Iron, the corrosion resisting alloy of pure iron, copper and molybdenum which is defying time in ventilators, cornices, down spouting, piping and roofing everywhere.

Toncan builds good will by keeping customers satisfied—and satisfied customers are the best assets any business can desire.

Write for free booklet on Toncan Iron, and let us give you details of the advertising plan which is making Toncan the everyday word for permanence.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES  YOUNGSTOWN, - OHIO

Birmingham
Denver
New York

Boston
Detroit
Philadelphia

Buffalo
El Paso
Pittsburgh

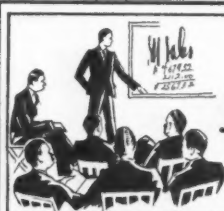
Chicago
Indianapolis
San Francisco

Cincinnati
Los Angeles
Seattle

Cleveland
St. Louis

Dallas
Milwaukee
St. Paul

Mention AMERICAN ARTISAN in your reply—Thank you!



ASSOCIATION ACTIVITIES

National Warm Air Association Announces Date of Mid-Year Meeting

The National Warm Air Heating Association, through its managing director, Allen W. Williams, announces that the regular mid-year meeting will be held December 2 and 3.

The place of the meeting will be the Deshler-Wallick Hotel in Columbus, Ohio.

Detroit S. M. & R. C. Assn. Fill Up Slack Season with Golf Practice—Maybe!

The members of this active association are still busy with their summer campaign of educational and instructive weekly golf tournaments. Some excellent talent is being brought out. Among the beginners who show great possibilities are Frank Robert of the Osborn Company and Charley Bernhagen of Sullivan-Bernhagen Company. Frank took to the game a few months ago following a miserable showing by his boss, Tony Howe. Tony had just experienced one of those perplexing afternoons so he suggested that Frank get busy and try his hand at the national pastime. He did this and now there seems to be some hope for the Osborn Company.

Charley Bernhagen was about in the same position as Frank. He followed his partner, Bill, around the course on several occasions and finally decided that the reputation of their concern, in golf, was being seriously impaired. He purchased some sticks, took a few dozen lessons, spent all his evenings on practice courses until now he is coming along fine.

Talking about good golfers, don't forget Bill Busch. He is showing a marked improvement in his game.

Especially in the counting end of it.

Occasionally someone, usually Bill Rettenmeir, suggests that the ladies be invited. This always meets with the universal approval of the Detroit members because they discovered a long time ago that the finest parties are those at which the ladies are in attendance. The most recent event of this kind took place at the Lakeshore Masonic Country Club on Wednesday, August 20. The chairman, commonly known as Dr. Schmaltz, sent out a very clever invitation, which naturally would be expected, but no one expected him to send the invitations to the homes instead of business places, but he did. They were sent to the wives and the scheme must have worked because they had a fine attendance.

National Hardware Assn. Will Hold 36th Convention in Atlantic City, October 20

The thirty-sixth annual convention of the National Hardware Association of the United States will be held in Atlantic City, October 20 to 23 with headquarters in the Marlborough-Blenheim hotel.

The theme of the convention will be: "How we can be better wholesalers."

The subjects of the various sessions will be on:

- Reduction of Overhead Expenses
- Increasing Turnover
- Analyzing Lines
- Analyzing Customers Accounts.

The joint session with the American Hardware Manufacturers Association will be held Monday evening, October 20.

This will be the first meeting since the formation of the National Association of Sheet Metal Distributors. The meeting of this new organization will be held Oct. 21.

Wisconsin Sheet Metal Association Reports on 1931 Convention

At the last meeting of the Board of Directors of the Master Sheet Metal Contractors Association of Wisconsin, a preliminary report on the 1931 convention was made.

The 1931 program is almost entirely outlined at this time and some very prominent and interesting speakers and subjects are being made ready for presentation.

Among these subjects are the following:

Address, Mr. Bennett Chapple, Vice-President, American Rolling Mill Co.

The Design of Sheet Metal Ducts in Connection with Air Conditioning, by Platte Overton of Chicago, Ill.

Your Business Records, by E. C. Park of Pittsburgh.

My Overhead as Applied in My Business, by C. F. Warning, Oshkosh.

What Is Your Compensation Insurance, by George L. Hayden, Milwaukee.

The 1931 meeting will be held in Milwaukee, February 2, 3 and 4.

Grand Rapids Heating Engineers Hold Meeting

On Tuesday, September 2, the Grand Rapids heating engineers held a monthly meeting with Building Inspector Seeger and his assistant as guests.

The purpose of the meeting was to iron out several points in the building code which govern the installation of warm air heating plants. Suggestions and criticism of the existing provisions were made and assurance was given that the suggestion would be considered in a revised code to be put into use.

INLAND
Increases Savings from
Steel

"Save with Steel"

"Galvanized Sheets Protect"

INLAND OPEN HEARTH STEEL

INLAND Copper-Alloy STEEL

Steel is a superior material for thousands of purposes. Inland strives to help steel users and Industry generally by supporting all constructive efforts to educate the public to the advantages and correct uses of steel in its many different forms.

But Inland goes further. By research work, by service—Inland *increases* savings from steel. Our vast resources are applied without stint to the problems of improving steel as a material for Industry's use . . . of producing a better steel for each application . . . of helping Inland users save more for themselves and for their customers by building up an adequate and reliable source of supply for the Central West.

Standardize on Inland . . . increase, protect your savings from steel.

"Steel Insures Strength and Security"

"Reinforced Concrete Economical—Enduring"

INLAND STEEL COMPANY

ABLE SERVANT OF  THE CENTRAL WEST

38 SOUTH DEARBORN STREET, CHICAGO

SHEETS, BARS, BANDS, STRUCTURALS, PLATES, RIVETS, RAILS, TRACK ACCESSORIES, BILLETS

Mention AMERICAN ARTISAN in your reply—Thank you!

NEW ITEMS *and* NEWS ITEMS

From and about the Manufacturers and Jobbers

Cary Mfg. Co., Waupaca, Wis., Introduces New Oil Burning Furnace

The Cary Manufacturing Company, Waupaca, Wisconsin, is now distributing a new oil burning furnace especially designed to meet the present day demand for properly humidified warm air heat. The furnace possesses several innovations in the way of construction and operating features.

The Cary furnace is entirely made of boiler plate with all joints welded air tight.

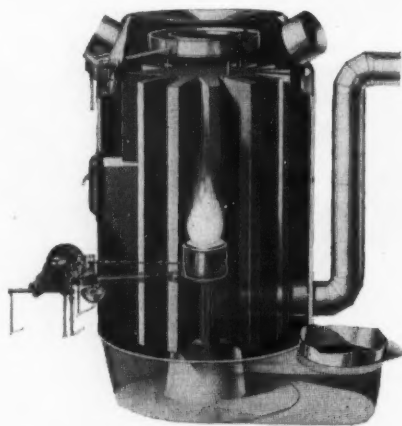
The stack is taken from the bottom of the furnace. The heat of the flame carries the gases directly from the burner to the top of the furnace. The cooling of the side walls naturally carry the gases back to the bottom of the furnace. As the gases cool and become heavier, they contract and fall. In the Cary furnace, the products of combustion must give off their heat before leaving the furnace at the bottom.

The walls are all vertical and are practically self-cleaning. There are no obstructions to the free passage of the air up on the outside and the gases down on the inside of the Cary furnace. The hottest point of the furnace is at the top, the coolest point at the bottom. The air passes up through the straight channels without obstructions. The walls are hotter as the air ascends and the speed of circulation of the air is greatly accelerated.

Another important feature of the Cary furnace is the large amount of surface for transmitting the heat from the combustion chamber to the circulating air.

All surfaces of the furnace are exposed to direct radiant heat from the flames. Soot or carbon will not accumulate in sufficient quantity to

obstruct the transmission of heat where the surfaces are exposed to the radiant heat of the flame. There are no baffles within the furnace, no obstructions of any kind, the nat-



ural course of the gases, due to heating and cooling, eliminating the necessity of baffles.

All furnaces are installed over a pit. The cool air, returning, can circulate from side to side of the furnace, through the pit, to equalize the temperature throughout the entire building.

The casing is made of galvanized iron on the outside, crimped, black iron on the inside, and three thicknesses of air-cell asbestos in between.

The Cary burner burns with a quiet, smooth fire, without odors and with an orange tip.

Armco Issues Second Architectural Bulletin

American Rolling Mill Company announces that they have ready for free distribution the second of their architectural bulletins. This bulletin tells all about the cooling and ventilating system installed in the Minneapolis auditorium.

portant features. Anyone wishing a copy of this bulletin can get one by writing the company.

Milcor Steel Company Issues New Price List

The first price list and catalog to be issued under the name Milcor Steel Company is now in the hands of 60,000 jobbers and dealers.

A short time ago the Milwaukee Corrugating Company and subsidiaries consolidated with the Eller Manufacturing Company, Canton, Ohio, under the name "Milcor Steel Company."

The new illustrated price list shows how completely the union of the firms has been achieved, for practically all of Milcor's products are now listed in the book produced for the former Eller plant, and vice versa. A number of additions were made to the Canton plant in order to provide complete manufacturing facilities.

Among the new products illustrated in the book are Milcor 1/4-in. Corrugated Non-Syphoning Roofing Sheets and SELFLOCK Single Tin Wall Pipe and Fittings. Non-Syphoning Roofing has a special patented feature which positively prevents leakage.

W. H. Davey and Associates Buy Canton, Ohio, Mill

W. H. Davey, chairman of the board of the Empire Steel Corporation, and associates have purchased the tin mill plant in Canton, Ohio, recently owned by the Canton Rolling Mills Corporation. Samuel Davey and W. R. Jenkins, who have been connected with the Empire Steel Corporation, will be associated with Mr. Davey in a new company which will be formed to operate the plant.

The plant will be reconditioned and used for the manufacture of tin plate and tin plate specialties.

ARMCO

INGOT IRON

pleases your customers
and brings shop economies

IF you are striving to build up a permanent, profitable business, consider the advantages of Armco INGOT IRON.

Here is the time-tried pure iron with the longest record of *actual service* of any low-cost, rust-resisting sheets and plates. Your customers know and approve Armco INGOT IRON, too. They have read about it for fifteen years in their favorite magazines. And they have seen the proof of its durability in many a veteran installation.

Important to you, also, is the workability of Armco INGOT IRON. It forms easily, swiftly and surely in crimper, brake, or rolls.

The next time your sheet metal salesman visits you, tell him you want to put in a stock of Armco INGOT IRON sheets and formed products. And if his firm doesn't handle it, there is a distributor near you who does.

The AMERICAN ROLLING MILL CO.
Executive Offices, Middletown, Ohio
Export: The ARMCO International Corporation

DISTRICT OFFICES:

Chicago
Cincinnati
Cleveland

Detroit
New York
Philadelphia

Pittsburgh
St. Louis
San Francisco



Perhaps no harder duty could be chosen for Armco INGOT IRON than these vent pipes and hoods over chemical vats—in the plant of the Upjohn Company, Kalamazoo, Michigan. Corrosive vapors attack the metal constantly. Yet the pure iron is going on its ninth year of uninterrupted service. Contractor: Kalamazoo Sheet Metal & Manufacturing Company.



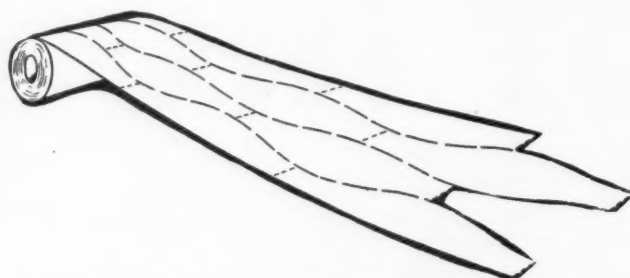
This is the familiar symbol that identifies Armco INGOT IRON sheets and formed products. It stands for the skill and experience of Armco—a company that has pioneered and specialized in the manufacture of high-grade special analysis iron and steel sheets for nearly thirty years. Always point out this triangle to your customers, so they may know they are getting long-lasting, low-cost sheet metal.

“BE SURE IT'S MADE OF ARMCO INGOT IRON”

Mention AMERICAN ARTISAN in your reply—Thank you!

Grant Wilson Making Ready-Cut Asbestos Elbow Wrappers in Roll Form

Grant Wilson Incorporated, manufacturers of asbestos insulating felt products, announce production of their asbestos elbow wrappers for warm air pipe elbows.



The manufacturers state that the die cuts are designed with all laps at the throat so that wrapping the segments around the elbow is a simple and quick operation.

It is claimed also that the use of these ready-cut wrappers saves time

and material and that a much neater appearance results. The wrappers are put up in a continuous roll with each roll containing sufficient segments for the covering of 25 complete elbows. They are being made for 8, 9, 10 and 12 inch four piece 90 degree elbows.

The company states that the as-

justed after enameling. The enamel sleeve (a patented feature) makes J-E-Namel as easy to install as regular black pipe. The sleeve covers an initial joint of 24 gauge black iron pipe which is fitted to any shape of stove collar and all cutting is done on the black joint to obtain the desired height to the flue.

A DAY'S WORK

(Continued from page 43)

at the figure quoted him provided the installation was made according to his suggestions. After going into a trance trying to figure out how a furnace could be installed according to Mr. Zuern's ideas, Mrs. Zuern, who had quieted down after the naughty words, stated that she would not want the furnace anyway because the doors did not face the coal bin door.

A party once told me I was too conscientious, in plain English, too damn conscientious to be a furnace salesman, and I guess that was the case, for I wilted into a chair and told Mr. Zuern my conscience wouldn't permit me to make the sale and I suggested that he install a hot water plant and he snapped back at me and said, no, the radiators take up too much room.

By the way, I saw the plans that a competitive salesman had figured and I rather think he will get the job as he has a warm air register coming into a doorway, Mrs. Zuern being opposed to having the cold air returns near the door, will favor this and there were only two cold air returns for the house, which is 30 x 34, two stories with a sun porch. My plan called for five cold air faces, which really is too many, Mr. Zuern thinks.

Frankly speaking, I don't think Mr. Zuern will ever enjoy the comforts of a good heating plant (on this earth).

If you care for any more detailed reports on some of my calls, I can give you others that will tie this.

Yours for less work and more sales,

A New Book on Electricity Now on Sale

"Electricity for Beginners," an elementary work on electricity written in non-technical language by Edward Harper Thomas, author of "Forty Elementary Lessons in Electricity," prepared originally for manual training classes in grade schools, published by Norman W. Henley Publishing Co., 2 West 45th Street, New York City. 172 pages, illustrated. Price \$1.50.

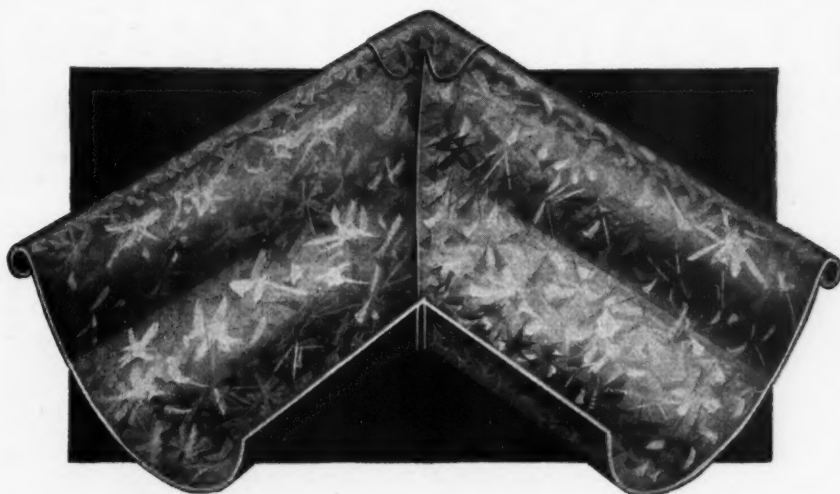
The average reader or student knows little about electricity other than its manifestations unless he has taken it as a special branch. The author examined a large number of text books and found them anything but simple and not at all fundamental. He conceived the idea of forty elementary lessons in electricity which would be given out in leaflet form to the schools requesting them, thus supplying one lesson a week for the entire school year.

Jacks-Evans Mfg. Co. Announce Vitreous Enamel Stove Pipe

The Jacks-Evans Manufacturing Company, 4400 North Union Boulevard, St. Louis, Missouri, announces a new stove pipe of vitreous enamel. The J-E-Namel Vitreous Enamel Stove Pipe and elbows have brought the stove pipe up to date. To match the beauty of enameled stoves, the J-E-Namel stove pipe developed by this company, carries the stove finish from collar to flue; whether it be deep, rich walnut or mahogany of a coal circulator, or the glistening white, gray or ivory of a range.

Beauty, however, isn't all that can be claimed for J-E-Namel. The vitreous enamel finish does away with the messy job of blacking—its beautiful glistening finish is retained by merely wiping with a cloth. Laboratory and actual service tests indicate long life for J-E-Namel.

This company has also perfected an elbow that can be ad-



The BARNES Super-Miter.
Uncomparably Rigid

Full of Merit
That is why
Barnes
Dominates



BARNES—that specially strength constructed Eaves Trough with the square, firm edge, meets all non-sagging test requirements.

Cash in on the Barnes line.
It is a genuine asset to the business growth of every sheet metal contractor in the country.



The BARNES Super-Self-Draining End and Outlet with Lock-Tite End Cap



BARNES METAL PRODUCTS COMPANY

4425 West 16th Street CHICAGO, ILLINOIS

Manufacturers of Conductor Pipe, Elbows, Eaves Trough and Fittings. - All Sizes - All Metals

Mention AMERICAN ARTISAN in your reply—Thank you!

~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

METALS

PIG IRON

Chicago Fdy.	No. 2	\$17.50
Southern Fdy.	No. 2	\$17.51 to 18.01
Lake Superior	Charcoal	27.04
Malleable		17.50

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC	20x28	112 sheets	\$22.50
IX	20x28		25.50
IXX	20x28	56 sheets	14.50
IXXX	20x28		15.50
IXXXX	20x28		17.00

TERNE PLATES

IC	20x28	40-lb.	112 sheets	\$24.00
IX	20x28	40-lb.	112 sheets	26.50
IC	20x28	25-lb.	112 sheets	20.50
IX	20x28	25-lb.	112 sheets	23.50
IC	20x28	20-lb.	112 sheets	19.00
IV	20x28	20-lb.	112 sheets	22.00

"ARMCO" INGOT IRON PLATES

No. 8 ga.	—110 lbs.	\$4.15
3/16 in.	—100 lbs.	4.05
1/4 in.	—100 lbs.	3.85

COKE PLATES

Cokes	80 lbs.	base, 20x28	\$12.00
Cokes	90 lbs.	base, 20x28	12.20
Cokes	100 lbs.	base, 20x28	13.75
Cokes	107 lbs.	base, IC	
	20x28		12.75
Cokes	135 lbs.	base, IX	
	20x28		14.75
Cokes	155 lbs.	base, 2X	
	56 sheets		8.50
Cokes	175 lbs.	base, 3X	
	56 sheets		9.35
Cokes	195 lbs.	base, 4X	
	56 sheets		10.25

BLUE ANNEALED SHEETS

Base 10 ga.	per 100 lbs.	\$3.35
"Armco" 10 ga.	per 100 lbs.	4.15

ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs.	\$3.75
No. 22	per 100 lbs.	3.70
No. 24	per 100 lbs.	3.75
No. 26	per 100 lbs.	3.85
No. 27	per 100 lbs.	3.90
No. 28	per 100 lbs.	4.00

GALVANIZED

No. 16	per 100 lbs.	\$3.85
No. 18	per 100 lbs.	3.95
No. 20	per 100 lbs.	4.15
No. 22	per 100 lbs.	4.20
(Standard differentials on extras to apply)		
No. 24	per 100 lbs.	\$4.35
No. 26	per 100 lbs.	4.60
No. 27	per 100 lbs.	4.70
No. 28	per 100 lbs.	4.85
"Armco" 24	per 100 lbs.	5.95

BAR SOLDER

Warranted 50-50	per 100 lbs.	\$19.00
45-55	per 100 lbs.	17.50
48-52	per 100 lbs.	18.00
Plumbers'	per 100 lbs.	15.50

ZINC

In Slabs		\$5.00
----------	--	--------

SHEET ZINC

Cask Lots (600 lbs.)		\$12.00
Sheet Lots (100 lbs.)		13.00

BRASS

Sheets, Chicago base		17 1/2 c
Tubing, brazed, Chicago base		24 1/2 c
Tubing, seamless, Chicago base		22 1/2 c
Wire, Chicago base		17 1/2 c
Rods, Chicago base		15 1/2 c

COPPER

Sheets, Chicago base	20 1/2 c
Tubing, seamless, Chicago base	22 1/2 c
Wire, plain rd., 8 B. & S. Ga. and heavier	12 1/2 c

LEAD

American Pig	\$6.00
Bar	7.50

TIN

Bar Tin	per 100 lbs.	\$32.00
Pig Tin	per 100 lbs.	31.00

SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	7 1/2 c per lb.
Mill board 3/32 to 1/4	7 1/2 c per lb.
Corrugated paper (250 sq. ft. per roll)	\$6.00 per roll

ASBESTOS SEGMENTS

8 in.	per 100 sets	\$7.30
9 in.	per 100 sets	8.30
10 in.	per 100 sets	9.30
12 in.	per 100 sets	10.50

CEMENT FURNACE

5-lb. cans, net	\$0.40
10-lb. cans, net	0.80
25-lb. cans, net	2.00
Per 100 lbs.	7.50

CLIPS

Damper	
No-Rivet Steel, with tail pieces,	
per gross	\$9.50
Rivet Steel, with tail pieces,	
per gross	7.50
Tail pieces, per gross.....	2.40

COPPER FOOTING

Copper Footing	39%
----------------	-----

CORNICE BRAKES

Chicago Steel Bending	
Nos. 1 to 6B	Not

CUT-OFFS

Cal., plain, round or cor. rd.	
26 gauge	30%
28 gauge	35%

DAMPERS

Yankee Warm Air	
7 inch, doz.	\$1.60
8 inch, doz.	2.20
9 inch, doz.	2.60
10 inch, doz.	2.80
12 inch, doz.	3.50
14 inch, doz.	5.00

EAVES TROUGH

Galv. Crimpedge, crated	75-10%
Zinc	60%

ELBOWS

Conductor Pipe	
Galv. plain or corrugated, round flat Crimp.	
28 gauge	60%
26 gauge	45%
24 gauge	15%
Galv. Terne Steel	
Plain Rd. and Rd. Corr.	
28 gauge	60%
26 gauge	45%
24 gauge	15%

Square Corrugated

28 gauge	50%
26 gauge	35%

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.	
Not nested	70 & 5%
Nested solid	70 & 5%

Sq. Corr., A. & B. & Octagon

28 gauge	50%
26 gauge	35%

Portico

1, 1 1/4, 1 1/2 inch	45%
----------------------	-----

Copper

16 oz. all designs	45%
--------------------	-----

Zinc

All styles	60%
------------	-----

ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue	
No. 28 Gauge, Doz.	
5 inch	\$1.15
6 inch	1.25
7 inch	1.75

Adjustable—Uniform Blue

No. 28 Gauge, Uniform Blue.	
5 inch	\$1.60
6 inch	1.75
7 inch	2.10

WOOD FACES—60% off list.

FIRE POTS

No. 02 Gasoline Torch, 1 qt.	\$5.15
No. 9250, Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

GLASS

Single and Double Strength, A, all brackets	85%
Single and Double Strength, B, all brackets	87%

HANGERS

Conductor Pipe	
Milcor Perfection Wire	25%
Milcor Triplex Wire	10%
Eaves Trough	
Steel (galv. after forming) from list	45%
Selflock E. T. Wire, List	10%

HOOKS

Conductor	
"Direct Drive" Wrought Iron for wood or brick	15%

MITRES

Galvanized Steel Mitres	
28 gauge	70
26 gauge	60-20

PASTE

Asbestos Dry Paste

200-lb. barrel	\$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

PIPE

Galvanized

Crated and nested (all gauges)	75-7 1/2%
Crated and not nested (all gauges)	75-2 1/2%

Furnace Pipe

Double Wall Pipe and Fittings	60%
Single Wall Pipe, Round Galvanized Pipe	60%
Galvanized and Tin Fittings	60%

Lead

Per 100 lbs.	\$12.50
Stove Pipe	
"Milcor" "Titelock" Uniform Blue	
28 gauge, 5 inch U. C.	\$11.00
28 gauge, 6 inch U. C.	12.00
28 gauge, 7 inch U. C.	14.00
30 gauge, 5 inch U. C.	10.25
30 gauge, 6 inch U. C.	11.00
30 gauge, 7 inch U. C.	13.00

T-Joint Made Up

6 inch, 28 ga.	per doz. \$3.40
----------------	-----------------

REGISTERS AND FACES

Floor Registers

Except Cast Iron	40 & 10%
Cast Iron	20%

Baseboard

2-Piece	40 & 10%
1-Piece	40-10 & 20%

Adjustable Ventilators

Adjustable Cold Air Faces	40 & 10%
Adjustable Ventilators	40 & 10%

RIDGE ROLL

Galv. Plain Ridge Roll	
b'd'd	75-15-5%
Galv., Plain Ridge Roll, crated	75-15%

SCREWS

Sheet Metal	
7 1/4 x 1/4, per gross	\$0.52
No. 10, 1/8 x 1/8, per gross	0.65
No. 14, 1/4 x 1/4, per gross	0.85

SHEARS, TINNERS' AND MACHINISTS'

Viking	\$22.00
--------	---------

Lennox Throatless

No. 18	35%
Shear blades	10%
(f. o. b. Marshalltown, Iowa.)	

SHOES

Galv. 28 Gauge, Plain or Corrugated, round flat crimp	60%
26 gauge, round flat crimp	45%
24 gauge, round flat crimp	15%

SNIPS

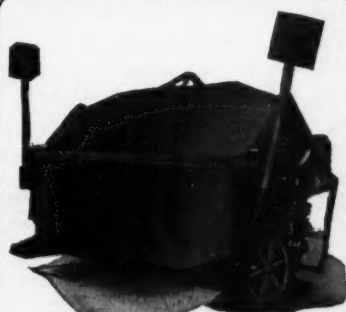
Tinners'	Not
----------	-----

VENTILATORS

Standard	30 to 40%
Milcor	Not

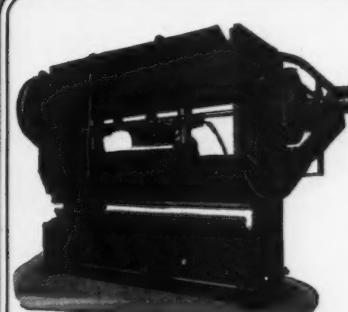
CHICAGO STEEL BENDING BRAKES AND FORMING PRESSES

The perfected result of over 30 years experience in the manufacture of sheet metal bending machines. Over 25,000 machines in use.



POWER BRAKE

Hand Brakes
Cornice Brakes
Power Brakes
Box and Pan Brakes
Forming Presses
Special Brakes and Presses



FORMING PRESS

The most complete and up-to-date line of sheet and plate bending and forming machines in the world. Lengths, 3 to 16 feet, with capacity to bend from the lightest metals up to $\frac{3}{4}$ in. plate, cold.

DREIS & KRUMP MANUFACTURING CO.

7404 Loomis Street • Chicago

ROCKFORD

means

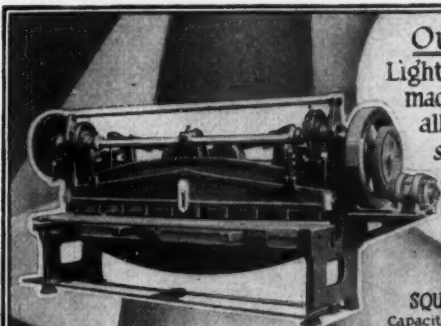
RUSH SERVICE

on all

Warm Air Heating Supplies

ROCKFORD SHEET STEEL CO., Rockford, Illinois

REGISTERS



Our Line
Light and heavy
machinery for
all classes of
sheet metal,
plate and
structural
work.

SQUARING SHEAR
Capacity 10" X 10 ga. sheet metal

BERTSCH & CO.
Cambridge City, Indiana

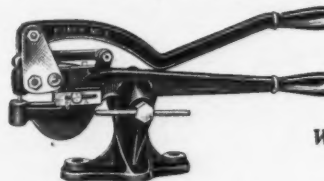
Do your work quicker and better with—

WHITNEY Lever PUNCHES.

The Choice of OVER 4000 Satisfied Users

Write for catalog and prices today

No. 8
CLOSE
CORNER
PUNCH

WHITNEY
VISE

CAPACITY $\frac{1}{4}$ in. through $\frac{1}{2}$ -in. iron. Weight $7\frac{1}{2}$ lbs. Length $18\frac{1}{2}$ inches. Depth of throat 2 inches. Upper lever does not throw back to right angles. Simple, easy and quick punch changing. Side Gauge with marked fractional inches. Sold with or without Vise.

This Vise is handy, practical and securely holds any of the Whitney Lever Punches. Well made of high-grade Malleable Iron. It bolts to bench or can be bolted to plank and used portably. Weighs only 5 lbs.

*It costs very little and is indispensable once
you use it—get yours now*

W. A. WHITNEY MFG. CO.

636 Race Street

Rockford, Ill.

Ask Your
Jobber for



TRADE MARK REGISTERED

Punches
and Tools

Mention AMERICAN ARTISAN in your reply—Thank you!

BUYERS' DIRECTORY

- Air Cleaners**
American Fdy. & Furnace Co., Bloomington, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.
- Air Washers**
A. Gehri & Co., Tacoma, Wash.
Watt Mfg. Co., Sterling, Ill.
- Aluminum Sheets**
J. M. & L. A. Osborn Co., Cleveland, Ohio
- Asbestos—Liquid**
Liquid Asbestos Mfg. Co., Des Moines, Iowa
- Bearings**
Fafnir Bearing Co., New Britain, Conn.
- Blast Gates**
Berger Bros. Co., Philadelphia, Pa.
- Blower Bearings**
Fafnir Bearing Co., New Britain, Conn.
- Blowers—Furnace**
American Fdy. & Furnace Co., Bloomington, Ill.
American Machine Products Co., Marshalltown, Iowa
A. Gehri & Co., Tacoma, Wash.
Brundage Co., Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.
- Bolts—Stove**
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
- Brakes—Bending**
Dreis & Krump Mfg. Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
- Brakes—Cornice**
Dreis & Krump Mfg. Co., Chicago, Ill.
- Brass and Copper**
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Copper & Brass Research Association, New York, N. Y.
Revere Copper & Brass, Rome, N. Y.
- Bronze**
Revere Copper & Brass, Rome, N. Y.
- Cans—Garbage**
Diener Mfg. Co., G. W., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
- Castings—Malleable**
Fanner Mfg. Co., Cleveland, Ohio
- Ceilings—Metal**
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Chaplets**
Fanner Mfg. Co., Cleveland, Ohio
- Cleaners—Vacuum**
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio
- Copper**
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.
Rockford Sheet Steel Co., Rockford, Ill.
- Cornices**
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Covering—Furnace Pipe**
Liquid Asbestos Mfg. Co., Des Moines, Iowa
- Cut-offs—Rain Water**
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Dampers—Quadrants—Accessories**
Aeolus Dickinson, Chicago, Ill.
Hart & Cooley Co., Holland, Mich.
Howes Co., S. M., Boston, Mass.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., New York, N. Y.
- Dampproofings**
Lastik Products Corp., Pittsburgh, Pa.
- Damper Regulators**
Sheer Co., H. M., Quincy, Ill.
- Diffuser—Air Duct**
Aeolus Dickinson, Chicago, Ill.
- Drills—Electric**
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
J. M. & L. A. Osborn Co., Cleveland, Ohio
The Stanley Electric Tool Co., New Britain, Conn.
- Drive Screws—Hardened Metallic**
Parker-Kalon Corp., 190 Varick St., New York
- Dust Eliminator**
Dustless Ash Co., Muskegon, Mich.
- Eaves Trough**
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.
- Elbows and Shoes—Conductor**
Apex Gutter Hanger Corp., New York, N. Y.
Barnes Metal Products Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.
- Fittings—Conductor**
Barnes Metal Products Co., Chicago, Ill.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Fluxes—Soldering**
Kester Soldering Co., Chicago, Ill.
- Furnace Cement**
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Furnace Chain**
Hart & Cooley Co., Holland, Mich.
- Furnace Cleaners—Suction**
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio
- Furnace Fans**
A-C Mfg. Co., Pontiac, Ill.
American Fdy. & Furnace Co., Bloomington, Ill.
Brundage Co., The Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Robinson Co., A. H., Massillon, Ohio
Warm Air Furnace Fan Co., Cleveland, Ohio
Watt Mfg. Co., Sterling, Ill.
- Furnace Filters**
Warm Air Furnace Fan Co., Cleveland, Ohio
- Furnace Paste**
Western Mineral Products Co., Omaha, Neb.
- Furnace Pokers**
Fanner Mfg. Co., Cleveland, Ohio
- Furnace Pulleys**
Hart & Cooley Co., Holland, Mich.
- Furnace Regulators**
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sheer Co., H. M., Quincy, Ill.
Tisch, Inc., Charles, Brooklyn, N. Y.
White Mfg. Co., Minneapolis, Minn.
- Furnace Rings**
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Furnace Switch—Automatic**
Payne Furnace & Supply Co., Beverly Hills, Cal.
- Furnaces—Gas**
Calkins & Pearce, Columbus, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Mueller Furnace Co., L. J., Milwaukee, Wis.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Rudy Furnace Co., Dowagiac, Mich.
Wise Furnace Co., Akron, Ohio
- Furnaces—Oil Burning**
Motor Wheel Corp., Heater Div., Lansing, Mich.
- Furnaces—Warm Air**
Agricola Furnace Co., Gadsden, Ala.
American Fdy. & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
The Beckwith Co., Dowagiac, Mich.
Brillion Furnace Co., Brillion, Wis.
Farris Furnace Co., Springfield, Ill.
Forest City-Walworth Run Fdy., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess Warming & Ventilating Co., Chicago, Ill.
Langenberg Mfg. Co., St. Louis, Mo.
London Furnace Co., London, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Syracuse, N. Y.
May Flebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Motor Wheel Corp., Heater Div., Lansing, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Premier Warm Air Heater Co., Dowagiac, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Rybolt Heater Co., Ashland, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Standard Fdy. & Furnace Co., De Kalb, Ill.
Success Heater Mfg. Co., Des Moines, Iowa
Schwab Furnace & Mfg. Co., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio
- Gas Burning Attachments**
Munkel-Rippel Heating Co., Columbus, Ohio
- Grilles**
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Tuttle & Bailey Mfg. Co., Chicago, Ill.
- Guards—Machine and Belt**
Harrington & King Perforating Co., Chicago, Ill.
- Handles—Boiler**
Berger Bros. Co., Philadelphia, Pa.
- Handles—Soldering Iron**
Hyro Mfg. Co., New York, N. Y.
- Handles—Furnace Door**
Fanner Mfg. Co., Cleveland, Ohio
- Hangers—Eaves Trough**
Apex Gutter Hanger Corp., New York, N. Y.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Heat Regulation Systems**
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Tisch, Inc., Charles, Brooklyn, N. Y.
Sheer Co., H. M., Quincy, Ill.
White Mfg. Co., Minneapolis, Minn.
- Heaters—Cabinet**
Fox Furnace Co., Elyria, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Motor Wheel Corp., Lansing, Mich.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Waterman-Waterbury Co., Minneapolis, Minn.
- Heaters—School Room**
Meyer Furnace Co., The Peoria, Ill.
Western Steel Products Co., Duluth, Minn.
Waterman-Waterbury Co., Minneapolis, Minn.
- Humidifiers**
Automatic Humidifier Co., Cedar Falls, Iowa
Diener Mfg. Co., G. W., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Sheer Co., H. M., Quincy, Ill.
- Lath—Expanding Metal**
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Machines—Crimping**
Bertsch & Co., Cambridge City, Ind.
- Machinery—Culvert**
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
- Machines—Tinsmith's**
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Tool Co., New Britain, Conn.
Whitney Mfg. Co., W. A., Rockford, Ill.
- Metals—Perforated**
Harrington & King Perforating Co., Chicago, Ill.
- Miters—Eaves Trough**
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
- Nails—Copper and Brass**
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.

(Continued on page 62)

Say you saw it in AMERICAN ARTISAN—Thank you!

TWO TAYLOR'S BRANDS

to Tie to

First in the minds of sheet metal men is our famous HAND MADE roofing tin—the highest quality, longest lived roofing tin in the world, the old "TAYLOR'S" Old Style, known since 1905 by the new name.

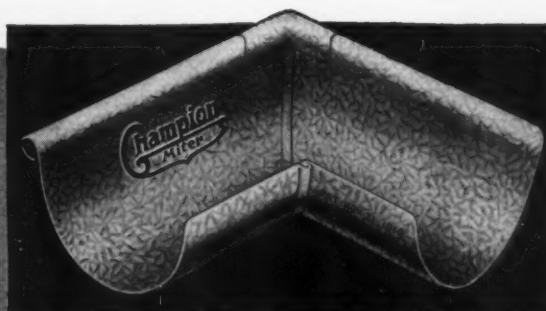


Now we have gotten out a New Tin, but the best machine made plate ever produced, for those who want to pay less. This is known as

Taylor's Extra Coated
40 lb. Copper Bearing O. H.

Ample stocks carried by all distributors. Ask them for TAYLOR'S.

N. & G. TAYLOR COMPANY
CUMBERLAND, MARYLAND
Headquarters for Good Roofing Tin Since 1810



BEST IN THE WORLD

"CHAMPION" Mitters will outlast the Eaves Trough. Galvanized after formation. Complete line of sizes and gauges.

For sale by all Jobbers.



BRADEN MANUFACTURING CO.
TERRE HAUTE ~ INDIANA

RYERSON

IMMEDIATE SHIPMENT FROM STOCK

More than twenty kinds of prime quality sheets are carried in stock. There is a special sheet for every purpose. Also Bars, Angles, Rivets, Bolts, Tools and Metal-Working Machinery.

Write for Journal and Stock List

JOSEPH T. RYERSON & SON INC.
Chicago Detroit Milwaukee St. Louis Jersey City Cincinnati Buffalo Cleveland Philadelphia Boston

SHEETS



LAMSON & SESSIONS CO.

CLEVELAND, OHIO

Plants at Cleveland and Kent, Ohio; Chicago and Birmingham

FOR SURE PROFITS

Manufacture Our Patented Product for Your Territory

Only one sheet metal contractor in every county can enjoy the profits available in this proposition. You do not have to operate a large shop to take on this connection although some of the largest shops in the country have secured the manufacturing rights.

You buy nothing but the right to use our highly successful patents in your territory.

We guarantee Patent Rights to you and give you full territorial and other protection.

Some of the largest concerns in the country are equipped with our product. (In the territory which we cover ourselves, the manufacture of this necessary equipment is our only business.)

You obligate yourself in no way by writing at once for full details.

THIS IS AN UNUSUAL OPPORTUNITY FOR YOU—THE RIGHT TO USE OUR HIGHLY SUCCESSFUL PATENTS IS AVAILABLE TO YOU ONLY BECAUSE IT IS NOT POSSIBLE FOR US TO OPERATE IN DISTANT TERRITORY. WRITE TODAY WHILE YOUR TERRITORY IS STILL OPEN.

Address F-526 care of

AMERICAN ARTISAN

139 North Clark Street

Chicago, Illinois

Mention AMERICAN ARTISAN in your reply—Thank you!

BUYERS' DIRECTORY

(Continued from page 60)

Nails—Hardened Masonry
Parker-Kalon Corp., New York, N. Y.

Oil Burners
Berryman System of Oil Heating, Inc., Chicago, Ill.
Bettendorf Mfg. Co., Bettendorf, Iowa
Bock Oil Burner Co., Madison, Wis.
Crystal Oil Burner Corp., New York, N. Y.
McIlvaine Burner Corp., Evanston, Ill.
Silent Automatic Corp., Detroit, Mich.

Paint
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Perforated Metals
Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peerless Foundry Co., Indianapolis, Ind.

Pipe and Fittings—Stove
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Pipe—Conductor
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Punches
Bertsch & Co., Cambridge City, Ind.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand
Hyro Mfg. Co., New York, N. Y.

Punches—Hand
Hyro Mfg. Co., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Putty—Stove
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets
Hart & Cooley Co., Holland, Mich.

Ranges—Gas
The Beckwith Co., Dowagiac, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Registers—Warm Air
Auer Register Co., Cleveland, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Hart & Cooley Co., Holland, Mich.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Ku-No Register Mfg. Co., St. Louis, Mo.
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Rock Island Register Co., Rock Island, Ill.
Symonds Register Co., St. Louis, Mo.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Registers—Wood
American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Regulators—Heat
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
H. M. Sheer Co., Chicago, Ill.
White Mfg. Co., Minneapolis, Minn.

Ridging
American Rolling Mill Co., Middletown, Ohio
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Rivets—Stove
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Rods—Stove
Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Roofing Cement
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.

Roof Paints
Lastik Products Corp., Pittsburgh, Pa.

Roof—Flashing
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Roofing—Iron and Steel
American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Roofing—Tin
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Taylor Co., N. & G., Philadelphia, Pa.

Rubbish Burners
Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting
St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating
St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal
Harrington & King Perforating Co., Chicago, Ill.

Scuppers
Aeolus Dickinson, Chicago, Ill.

Shears—Hand and Power
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Tool Co., New Britain, Conn.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping
Parker-Kalon Corp., 200 Varick St., New York

Sheets—Alloy
International Nickel Co., New York, N. Y.
Republic Steel Corp., Youngstown, Ohio

Sheets—Black and Galvanized
American Rolling Mill Co., Middletown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Republic Steel Corp., Youngstown, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Iron
American Rolling Mill Co., Middletown, Ohio
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Republic Steel Corp., Youngstown, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Sheets—Tin
Taylor Co., N. & G., Philadelphia, Pa.

Shingles and Tiles—Metal
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Sifters—Ash
Diener Mfg. Co., G. W., Chicago, Ill.

Sign Equipment—Electric
Metal Products Co., Milwaukee, Wis.

Sky Lights
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Snips
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Solder—Acid Core
Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing
Kester Solder Co., Chicago, Ill.

Solder—Rosin Core
Kester Solder Co., Chicago, Ill.

Solder
Kester Solder Co., Chicago, Ill.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Soldering Coppers
Revere Copper & Brass, Rome, N. Y.

Soldering Furnaces
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Specialties—Hardware
Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning
Fanner Mfg. Co., Cleveland, Ohio

Tinplate
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Tinsmith's
Bertsch & Co., Cambridge City, Ind.
Dries & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Electric Tool Co., New Britain, Conn.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.

Torches
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Trade Extension
Copper & Brass Research Association
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio

Trimings—Stove and Furnace
Fanner Mfg. Co., Cleveland, Ohio

Vacuum Cleaner—Furnace
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

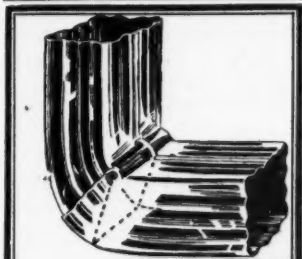
Ventilators—Floor
Aeolus Dickinson, Chicago, Ill.

Ventilators—Roof
Aeolus Dickinson, Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Paul R. Jordan & Co., Indianapolis, Ind.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Ventilators—Ceiling
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio

Wood Faces—Warm Air
Auer Register Co., Cleveland, Ohio
American Wood Register Co., Plymouth, Ind.
Milcor Steel Co., Canton, Chgo., La Crosse, K. C.

Mention AMERICAN ARTISAN in your reply—Thank you!



Like the
human elbow
—adjustable



NOTE: Extra double wall thickness at the most vital point

You have been waiting for this adjustable down-spout elbow— THE "MASTER" ADJUSTABLE ELBOW

Is a Time and Labor Saver

This patented elbow can be adjusted to any degree of pitch between 15 and 90°. No tools are needed. The patented features of this elbow enable you to connect gutter and down spout in a few seconds.

The Most Revolutionary Time and Labor Saver of Recent Years
No Higher Cost for the "Master" Elbow

Further Information on Request

APEX GUTTER HANGER CORP. 15 MOORE STREET
NEW YORK CITY



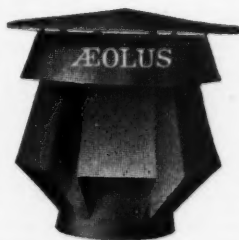
The "Torrid" Furnace is designed to give a tremendous amount of heat, much more than that furnished by the ordinary tinner's furnace.

A fuel saver and generating machine of the finest quality made at the price.

GEO. W. DIENER MFG. CO.
404 North Monticello Ave. Chicago

Specify

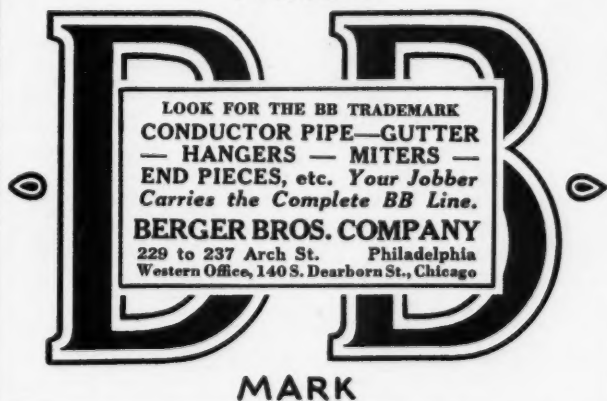
ÆOLUS
Improved
VENTILATORS



FOR industrial buildings, schools, homes, theaters, etc. Made in 14 different metals. Constant ventilation—no noise—no upkeep.

ÆOLUS DICKINSON
Industrial Division of Paul Dickinson, Inc.
3332-52 South Artesian Avenue
Chicago, Ill.

TRADE



LOOK FOR THE BB TRADEMARK
CONDUCTOR PIPE—GUTTER
— HANGERS — MITERS —
END PIECES, etc. Your Jobber
Carries the Complete BB Line.
BERGER BROS. COMPANY
229 to 237 Arch St. Philadelphia
Western Office, 140 S. Dearborn St., Chicago

MARK

Mention AMERICAN ARTISAN in your reply—Thank you!



Machines

that make extra profits
for

THE SHEET METAL SHOP

Rotary Throatless Shears
—hand or power operated
Plate Bending Rolls
Splitting Shears
Bevel Shears
Punch Presses
Pressure Gauges

Address Dept. A. A. for Catalog
MARSHALLTOWN MANUFACTURING CO.
Marshalltown, Iowa

CUT OPERATING COSTS

Without sacrificing quality or reducing wage schedules you can cut operating costs with KESTER Acid-Core Solder. The flux in the core saves material, time and labor, yet insures a perfect sheet metal job. On 1, 5 and 20 lb. spools. The larger the package, the greater the saving.

From all Jobbers
KESTER SOLDER COMPANY
4241 Wrightwood Avenue Chicago
Incorporated 1899



KESTER
FLUX-CORE
SOLDER

Alphabetical List of Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

A-C Mfg. Co.....	16	Lastik Products Co.*.....	...
Aeolus Dickinson	63	Lennox Furnace Co.....	9
Agricola Furnace Co.....	2	Liquid Asbestos Mfg. Co.*.....	...
American Brass Co.*.....	...	London Furnace Co.....	13
American Fdy. & Furn. Co.....	16	Marshall Furnace Co.*.....	*
American Furnace Co.....	7	Marshalltown Mfg. Co.....	63
American Machine Products Co.....	17	May-Fiebeger Co.*.....	...
American Rolling Mill Co.....	55	McIlvaine Burner Corp.....	3
American Wood Register Co.*.....	...	Metal Productss, Inc.*.....	...
Apex Gutter Hanger Corp.....	63	Meyer & Bro. Co., F.*.....	...
Auer Register Co.....	18	Meyer Furnace Co.....	5
Automatic Humidifier Co.....	20	Midland Furnace Co.*.....	...
Barnes Metal Prod. Co.....	57	Milcor Steel Co.....	Back cover
Beckwith Co.	12	Miller & Doing, Inc.*.....	...
Berger Bros. Co.....	63	Minneapolis-Honeywell Reg. Co.....	10
Berryman System of Oil Heating, Inc.....	15	Motor Wheel Corp., Heater Div.*.....	...
Bertsch & Co.....	59	Munkel-Rippel Heating Co.....	20
Bettendorf Mfg. Co.....	15	Mt. Vernon Furnace & Mfg. Co.....	14
Bock Oil Burner Co.*.....	...	Mueller Furnace Co.*.....	...
Braden Mfg. Co.....	61	National Assn. of Flat Rolled Steel Mnfrs.*.....	...
Brillion Furnace Co.....	14	National Super Service Co.....	14
Brundage Co.	16	Osborn Co., The J. M. & L. A.....	21
Calkins & Pearce*.....	...	Parker-Kalon Corp.	67
Central Alloy Division Republic Steel Corp.*.....	...	Payne Furnace & Supply Co.....	19
Chase Brass & Copper Co.*.....	...	Peck, H. E.....	66
Connors Paint Co., Wm.....	21	Peerless Foundry Co.....	13
Copper and Brass Research Assn.*.....	...	Premier Warm Air Heater Co.....	23
Crystal Oil Burner Co.*.....	...	Republic Steel Corp.....	51
Diener Mfg. Co., Geo. W.....	63	Revere Copper & Brass, Inc.*.....	...
Dreis & Krump Mfg. Co.....	59	Richardson & Boynton Co.*.....	...
Dustless Ash Co.....	20	Robinson Co., A. H.*.....	...
Eissler Hardware*.....	...	Rock Island Register Co.*.....	...
Fafnir Bearing Co.*.....	...	Rockford Sheet Steel Co.....	59
Fanner Mfg. Co.*.....	...	Rudy Furnace Co.....	20
Farris Furnace Co.....	20	Ryerson & Son, Inc., Jos. T.....	61
Forest City-Walworth Run Foundries Co.....	4	Schwab Furnace & Mfg. Co.....	20
Fox Furnace Co.....	8	Sheer Co., H. M.....	17
Gehri, A., & Co.....	11	Silent Automatic Corp.....	24
Harrington & King Perf. Co.....	21	Standard Fdy. & Furn. Co.....	12
Hart & Cooley Co.....	18	Stanley Electric Tool Co.*.....	...
Henry Furn. & Fdy. Co.....	6	St. Louis Tech. Inst.*.....	...
Hess Warming & Ventilating Co.*.....	...	Success Heater Mfg. Co.*.....	...
Howes Co., S. M.....	21	Symonds Register Co.....	18
Hyro Mfg. Co.*.....	...	Taylor Co., N. & G.....	61
Independent Reg. & Mfg. Co.*.....	...	Tisch, Inc., Charles*.....	...
Inland Steel Co.....	53	Tuttle & Bailey Mfg. Co.....	18
International Nickel Co.*.....	...	Viking Shear Co.....	66
Interstate Machinery Co.*.....	...	Warm Air Furnace Fan Co.....	19
Jordan & Co., Paul R.*.....	...	Watt Mfg. Co.....	17
Kester Solder Co.....	63	Waterman-Waterbury Co.	20
Ku-No Register Mfg. Co.....	21	Western Mineral Products Co.....	20
Lakeside Co.	17	Western Steel Products Co.*.....	...
Lammeck & Co., W. E.*.....	...	White Mfg. Co.....	15
Lamson & Sessions Co., The.....	61	Whitney Mfg. Co., W. A.....	59
Langenberg Mfg. Co.*.....	...	Wise Furnace Co.*.....	...

THE BUYERS' DIRECTORY APPEARS ON PAGES 60 AND 62

WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE for three insertions.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired, and must reach our office ten days prior to date of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

SITUATION WANTED

An experienced superintendent of sheet metal construction work is open for a position offering greater responsibilities and possibilities than he has at present. Possesses complete practical knowledge of estimating, detailing and pattern drafting backed with 20 years' experience. He has superintended the installation of heating and ventilating equipment in some of the largest contracts in Ohio. He is an American, married with family, good health, an industrious worker, can furnish A-1 references, and is willing to locate wherever the best opportunity exists. Address B-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—For a graduate of the Mooseheart Sheet Metal School. This boy is about 21 years of age and has been working in a general sheet metal shop in Chicago for approximately two years. He has had considerable experience on furnace and general outside work. Now employed but wishes to leave Chicago for employment in a shop where he can complete his trade and have an opportunity for advancement. For further information and recommendations, address Mooseheart Sheet Metal Department, Mooseheart, Ill. E-527

Sheet metal shop superintendent thoroughly experienced in assuming full responsibility on all types of fabricating and carrying to completion outside construction jobs. Can handle any number of men satisfactorily. Several years' experience with largest shops and contractors in country. Experienced in ventilation, humidity control, blower systems, etc. Go anywhere. Address O-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By an experienced furnace salesman, also experienced in greenhouse heating. Can lay out work in furnaces also greenhouses in steam and water. Sixteen years with one company. In position to go to any state. Address C-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By plumber, fitter and sheet metal worker. Many years of experience. Used to high-class work and can handle men to advantage. At present employed at union wages, but wanted to make a change before winter. No bad habits. Prefer Central West States. If interested, write, giving hours and wages paid. Address Box 348, Saco, Mont. D-527

Situation Wanted—By an all-round sheet metal worker. Can handle any branch of the trade, such as cornice, skylight, ventilation and furnace work. Can make estimates and can run the shop. Address T-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By an A-1 mechanic; 28 years' experience in ventilating, heating and general job work. Will accept position in small town at \$30 a week. Best of references furnished. Address R-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Situation Wanted—Sheet metal worker, thoroughly experienced in ventilating, cornice, skylight, hotel and restaurant equipment, boiler breeching, blowpiping, and general all-round work, wants steady position. Thorough knowledge of Triangulation. Can lay out any kind of work. Practical, steady worker. Can do acetylene and electric spot welding. Also experienced in warm air heating installation. Address D-528, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By man 38 years of age, with 15 years' experience in the warm air heating field, as salesman for a reliable furnace manufacturing company or salesman and engineer for a dealer. Can do own layout and drafting, also capable of handling forced air jobs. Can furnish best of references. Address P-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Young man 29 years of age with 8 years' experience in large tin shop, wants position. Can qualify in cornice, skylight, blowpipe, furnace work, gutters and all tin work that comes into a tin shop. Also experienced in roofing such as slate, tile, tin or built up roofs. Can also draught my own patterns. Married and steady. Address A-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position Wanted—By sheet metal worker and warm air heating man. Would like to connect with hardware firm having sheet metal shop. Have no objection to working in store slack time or making myself useful in any capacity. 33 years of age, 14 years at the trade; want steady position and will go anywhere. Address E-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Executive and Heating Engineer—35 years old, 15 years' experience in the manufacture, installation and sales of stoves and furnaces. Has had charge of production, credit, accounting and sales departments. Compensation proposition is important but first consideration is permanent position with possibilities. For further details, address A-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—A sheet metal mechanic that knows his stuff, is looking for position. Jobbing, cornice, skylight, blow pipe and ventilation as well as layout work. Experienced in factory work. Sober, married, steady, a hustler and about 30 years of experience. 48 years of age, good health. Please state particulars and pay. Address E. W. Hiatt, care of A. J. Balsiger, Underwood, Wash. R-526

Situation Wanted—By all-round tinner and warm air furnace installer. Especially good on furnace work. Union or non-union shop. Prefer to locate in a general combination shop in a small town. Good, steady, reliable worker. Will go anywhere. Address W-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

Situation Wanted—Combination sheet metal worker, plumber, steam and hot water fitter and furnace man. Would like shop connected with hardware store. Year around job. Middle aged, married and sober. Have worked at these trades 22 years. State wages. Can come at once. Address P-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By sheet metal worker. Experienced in general lines, cornices, heating and special work. Good pattern cutter and shop man. Neat and accurate mechanic. Health and habits are good. Can take charge if required. Address S-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Sheet metal worker, plumber and heating man, first class man in all branches of the trade, wants position. Sober, reliable, steady man, fully able to take charge of work. Good on gas installations and duct work. Address C-528, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By hardware man who has had 12 years experience in hardware, sheet metal and furnace work. Can handle one or all. Middle west town preferred with steady work. No objection to small or large town. Address T-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position Wanted—By man with 28 years' experience in tinning, furnace work, plumbing, spouting and all kinds of general work. Prefer Iowa or Wisconsin. Address O-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Situation wanted by an all around tinner and furnace man, furnace heating a specialty. Can also do plumbing and assist in hardware store. Steady and reliable, no floater. Permanent position wanted in small town or city in Central Western States. Address J-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—Good all around tinner and furnace and gutter work. Can handle all small town shop work. Steady, reliable and sober. 8 years in last town. Can go at once to any small town or city in Illinois. Will work for nominal wages. Phone (Chicago) Mansfield 9132 or address F-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By a first class tinner and sheet metal mechanic in all branches of the trade, heating and ventilating, furnace work, hotel and kitchen equipment, dairy equipment and general sheet metal work of any kind. Address Z-524, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By first class sheet metal worker, plumber and warm air furnace heating man. Would like a position with hardware firm. Iowa or Illinois preferred. Address B-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

There is somebody somewhere in the U. S. A. about this time of the year that is either in need of a good tinner or furnace man, or will be in near future. So let's get together—What am I offered for this service. Address H. S. Glenn, Box 58 Mountain Grove, Mo. S-526

Situation Wanted—By first class sheet metal worker. 20 years' experience at the trade in all its branches. Can read blueprints, cut patterns and handle any kind of job that comes to a sheet metal shop. Address Edward H. Collins, 154 Oakland Avenue, Macon, Ga. M-526

Situation wanted by sheet metal worker. Older man who can work from blue prints, lay out, cut patterns and handle anything in the building line. Address K-525, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By practical sheet metal worker on cornice, skylight, heating, ventilation and blowpipe. Estimator and layout man. Middle aged and reliable. Will go anywhere. Address C-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By sheet metal worker experienced on ventilation work, blow-piping, boiler breechings and heavy gauge work from blue prints. Address P. O. Box 1385, Hammond, Ind. B-525

BUSINESS CHANCES

For Sale—Hardware business, established 20 years. Best location in town of 3,000; paved streets, waterworks. Good payroll. Farming community. Stock and fixtures invoice \$5,000. Good going business in one of the best towns in Missouri. "Grab" this before someone beats you to it. Have other business, reason for selling. Address B-528, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Sheet metal, heating and tin business in Central Indiana. Good chance to add plumbing. Retiring after 31 years. Rent cheap, with lease if wanted. Will sell for less than inventory. Less than \$2,000 will handle this on part time if wanted. Address G-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

For Sale—A-1 sheet metal works with hardware store combined, in Northern Illinois, for someone looking for a good up-to-date business who can handle same. This is a great opportunity for advancement. Write H-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

For Sale or Exchange—For hardware or plumbing and tin shop with building, a 127-acre farm in Northern Indiana. Prefer property in South or Southwest. Address S. N. Eversole, Baldwin Lake Road, Bristol, Ind. J-527

For Sale—Radiator repair shop and Smith's welding equipment. Address J-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Mention AMERICAN ARTISAN in your reply—Thank you!

BUSINESS CHANCES

For Sale—Tin and plumbing shop in a town of 900 population in Benton County, Indiana. Rich farming community in corn belt. Selling on account of ill health. Building can be used for shop and dwelling (6 rooms and shop), also garage in rear. Stock and tools invoice about \$500.00. Will rent buildings or sell them at a bargain. Address W. R. Hart, Boswell, Indiana. L-526

For Sale—Established sheet metal, furnace and roofing business in the best county seat town in Northern Minnesota. Shop is well equipped including 8 foot brake and all tools are in first class shape. This is a real buy for someone as I must dispose of shop at once. Other interests reason for selling. Address E-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—One-third interest in plumbing, heating and sheet metal and hardware business. One of the best equipped and most reliable establishments of its kind in Northwest Iowa. Steadily growing increase in business. Well known over a large territory with a wide range of customers. Excellent opportunity for interested party. Address Y-524, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Tin and repair shop. Equipped with good machinery and supplies. Only shop in town of its kind. Will sell outright or separately on account of ill health. This is a good opportunity and will stand investigating. Address D-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Inventor has invented and U. S. Pat. applied for a steel furnace with a heating and frigid forced air combination. Desires connection with reliable mfg. concern. Address M. Braundston, 706 West 120th Street, Chicago, Illinois. M-525

For Sale—Sheet metal, general repair and furnace shop. Splendid location and wonderful opportunity for the right man. A real bargain. Address K-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Sheet metal and plumbing shop. Best location in Iowa. Will sell at sacrifice if taken at once. Health reason for selling. Address L. L. Furman, Williamsburg, Iowa. H-526

For Sale—One Sturtevant Vacuum Furnace Cleaner in good condition. Price \$150.00. Address R. Brands, Morrison, Ill. R-525

HELP WANTED

Wanted—Reliable industrial sheet metal worker, not over 40 years of age—capable without instructions to handle any and all kinds of shop job work—blow pipe—skylight—cornice—ventilation and furnace jobs—must be willing to do in and outside jobs from start to finish. Address H. T. Klugel, North Emporia, Virginia. A-527

Wanted—A first-class tinner and furnace man. One who can canvass the city for work, and work on a percentage basis. We have a city of 10,000 with four shops. Plenty of work if one would go after it. Sickness compels me to give up the work. Address F-527, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Reliable Tinner Wanted—Must have experience in school house heating and ventilating as well as all around sheet metal work. Address Benton Sheet Metal Works, 122 Water St., Benton Harbor, Mich. W-526

Experienced Radiator Repair Man Wanted—Central Wisconsin city of 9,000. Address X-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

TOOLS AND MACHINES

For Sale—30" square shears with extra blade, combination bench machine with five sets rolls, 20" grooving machine, 30" roller, double seaming machine, large bench shears, beader with two sets rolls, setting down machine, small burring machine, breakhorn stake, sound stake, Lufkin pattern rule and chart in wooden case. All in good condition and for \$130.00. Will sell separate. Address Z-526, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—8-foot Double Truss Brake, one 30-inch Square Shear, one 30-inch. Forming Rolls, Crimper, Beader, Niagara Elbow, Small Turner, Bench Shears, all in A-1 condition. Priced for quick sale at \$150. Address Charles Y. Nellis, 705 Franklin St., S., Robinson, Illinois. X-527

For Sale or Trade—One model "T" Ford with wheels extended back two feet with an 8-foot box all equipped for ladders. Has an extra shift. All in good condition. Just the thing for a Sheet Metal Shop or Hardware. If interested, write L. T. Peterson, Denison, Iowa. Y-527

For Sale—One 10-ft. cornice brake, almost new, made by Dreis & Krump Mfg. Co. Price \$190. Address A. W. Dietzel, 207 East 4th, Hermann, Mo. K-527

SPECIAL NOTICES

The Rate for Special Notices
—displayed want ads—

\$3.00 per inch per insertion
When sending copy, state whether your name or blind number is to be used—also how many insertions are desired.

PATENTS

HUBERT E. PECK
Patent Attorney
Barrister Bldg., WASHINGTON, D. C.

ATTENTION FURNACE SALESMEN

We want one or more good salesmen to contact jobbers—not the ordinary furnace salesman but the type of man who can meet large buyers at the same time assisting in training jobbers' salesmen. If you are the man for the job you may write us in full confidence. Write us in detail and tell us why you feel that you will prove valuable to us. Address M-527, American Artisan, 139 N. Clark St., Chicago, Ill.

SPECIAL NOTICES

SALESMAN WANTED

A well known midwestern manufacturer requires an experienced cast furnace salesman for Wisconsin, Minnesota and part of North and South Dakota. Immediate employment, good salary and permanent connection for the right man. Write, stating age, previous connections and sales record. Address L-527, American Artisan, 139 N. Clark St., Chicago, Illinois.

ECONOMY "STIL-BLADE" FURNACE FAN

Saves fuel and eliminates cold rooms. Built for coal, oil or gas burning furnaces. It's practically noiseless. Write for circulars and territory that is open. Representatives wanted.

C. A. STILPHEN ENGR. & MFG. CO.
1129 18th St., Denver, Colo.

X-524

SALESMAN WANTED

Old manufacturer of cast and steel furnaces requires the services of salesman for several Southern states. Please state your past ten years' employment in answering. Address Z-527 AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SALESMEN WANTED

Large retail organization with stores in all states requires salesmen with country hardware store experience. Must be familiar with hardware, plumbing, warm air furnaces, stoves, paint, roofing, etc. Position permanent, with moderate starting salary and good future. Give full details to receive reply. Address A-528, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

FURNACE SEALING

properly done insures satisfied customers. Why not use these up-to-date furnace cements.

METALUTE Plastic Iron, the new scientific, non-mud cement for setting furnaces.

12 lb. can \$2.40

INSA-LUTE Liquid Porcelain used extensively for double sealing leaky furnaces without tearing them down.

8 lb. can \$2.00

COLOR-BESTOS Asbestos in Paint Form for protecting castings, furnace pipes, walls, etc. Made in standard colors.

½ gal. can \$2.00

Prices f.o.b. Pittsburgh, Pa.

Technical Products Company
Sharpsburg Post Office
Pittsburgh, Pa.



Send for catalog today

VIKING SHEAR

Compound LEVER Handle—Removable Blades

A child can work them

VIKING SHEAR CO., Erie, Pa.

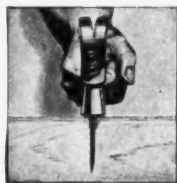
Say you saw it in AMERICAN ARTISAN—Thank you!



PIERCES *sheet metal like a punch* **HOLDS** *metal to wood like a screw*

You need no longer be troubled with nails that bend and back out. Nor do you need costly wood screws to securely fasten sheet metal to wood. Now you have a fastening device especially developed for that work—the Hardened Screwnail. Try it . . . see how easily strong fastenings can be made with this unique Nail.

You'll find that a Screwnail can be driven through sheet metal into wood much more easily than an ordinary nail. A single hammer blow sends the punch-like point through the metal. It is hard to bend or break a Screwnail, too, because of its great tensile and shear strength.



As the Screwnail is driven its hardened spiral thread cuts into the sheet metal and worms its way into the wood. It cannot back out, pull out or loosen. Laboratory tests prove conclusively that this unique Nail has over 4 times the holding power of an ordinary nail.

Introduced less than a year ago, Hardened Screwnails have already been tried and adopted by thousands of sheet metal workers. Screwnails enable them to do a better job . . . and do it easier. If you haven't tried Screwnails—send the coupon now for free samples.

PARKER-KALON HARDENED *Screwnails*

PATENTED JAN 29 1924—NO. 1482151 OTHER PATENTS PENDING
TRADE MARK REG U S PAT OFF

PARKER-KALON CORPORATION 190 Varick St. NEW YORK, N. Y.

Send me samples of Hardened Screwnails. I want to try them for:

Name

Address

another MILCOR triumph

SELFLOCK

... the greatest wall
pipe improvement in
10 years

A startling new development is announced by *Milcor*... a complete line of single Wall Pipe and Fittings having the famous SELFLOCK joint and end joints that lock in a permanent way.

Simply press the side seam and it locks. Turn over a lip on each end of the seam . . . and the seam is locked the long way of the pipe. The end locks are integral with the pipe. Press the ends together until



there is a slight click . . . and the sections are locked to stay. Fast assembly . . . no tools required . . . bigger profits for you in less time.

Send for a copy of the new *Milcor* Catalog No. 30.
It gives complete information.

MILCOR PRODUCTS

MILCOR STEEL COMPANY

(formerly Milwaukee Corrugating Co., Milwaukee, Wis. and The Eller Mfg. Co., Canton, Ohio)

Main Offices: 1417 Burnham Street, Milwaukee, Wis.
Milwaukee, Wis. Canton, Ohio

Sales Offices: New York, 418 Pershing Square Building; Boston, Mass., 726 Little Building; Atlanta, Ga., 207 Bona Allen Building; Minneapolis, Minn., 642 Builders Exchange Building; Little Rock, Ark., 104 W. Markham Street